The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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Gardner's Patent Three-Cylinder Engine.

We present this week illustrations of a new three-cylinder engine which is manufactured by Messrs R. Dunbar & Son, of Buffalo, N. Y., and as it embodies several new and interesting features, a description will undoubtedly be of interest. An inspection of the engravings will show that it has several points of excellence, and in our subsequent remarks we will endeavor to point out some of them for the benefit of our readers. Fig. 3 is a transverse section of the engine, showing the cylinders and pistons and connecting rods, and also a broken section of the steam and exhaust passages. It will be seen that the engine has no dead center, and can therefore be started with the crank in any position and as the pistons are all single acting, the connecting-rods are always in compression, and there is consequently no sudden blow or pound upon the crank-pin, even when the fit is not perfect. The pistons are deep and well packed, and guide themselves in the cylinders, and are connected to steel connecting-rods, the ends of which form the connections with the crank-pin. There is, strictly speaking, no piston-rod, and a considerable economy of space is therefore obtained. The connecting-rods are attached to the pistons in the manner shown in Figs. 3 and 5, and the pistons will follow up their connections until worn out. On the end of each connecting-rod is a compensating box, which, in case of wear, can be replaced without much trouble, thus making the connection as good as new. As soon as steam is admitted into the cylinder the power is communicated to the crank-pin directly, and as there is no cross-head or other intervening mechanism, the friction attending the transmission of power to different parts, as in the ordinary engine, is entirely avoided. The valves are ordinary slide-valves, as will be seen in Fig. 5, and each one is scraped in such a manner as to afford efficient protection against any leakage of steam. The valve motion is exceedingly simple, one eccentric in one revolution completing the travel of the three valves. The crank-shaft is counterbalanced so as to insure steady running while the engine is at work, and extends through boxes in the bed-plate, and the bearing on the pulley end is very long, so as to reduce the wear to a minimum. A gear-wheel on the front end of the shaft, as shown in Fig. 1, establishes connection with the governor gear, making the governor a part of the engine itself, and thereby insuring a uniform motion. It will be seen that there are no belts, and there is consequently no slipping, and the governing power is therefore very efficient. All parts of the governor are accessible, and the speed of the engine can be changed to any extent desired within the range of the governor. The packing cups around the three valve rods are very deep, and when once packed a slight turn of the gland is all that is necessary to re-establish the proper conditions in case any steam should leak through them. The front and back portions of the shaft are packed only against exhaust steam. The circular ring or belt of which the cylinders form a part also forms the valve seats, and it will be observed that the valves and seats are as close to the cylinders as is possible. The passages in the belt or ring mentioned are of sufficient size to prevent to a large extent any great reduction of pressure, and the stem is cut off so as to work expansively in each cylinder, thereby securing a large proportion of the power of the steam before the latter is allowed to escape. A front view of the engine is given in Fig. 2, by an inspection of which the arrangement of the several parts will be more easily understood. Fig. 1 represents a side view of the engine, arranged for stationary purposes, showing the governor stand, steam pipe to the engine, main shaft and stand, with band-wheel and outrigged plummer block, and also some of the other details mentioned in our preceding remarks. The patent automatic oil cup shown on the top feeds the oil into the cylinders with every stroke of the engine, and permits a thorough lubrication of the internal working parts.

Fig. 5 represents a very simple design of steam hoister suitable for any purpose where rapid hoisting is required, such as on vessels, barges, steamers, docks and mines, &c., and it will be seen that the general arrangement is very simple, all complicated foot levers, handles, brakes and clutches being avoided. After the opening of the throttle of the engine, the lever handle on the left engages the brake band which sets the drum in motion to raise or hold the load in place. The brake to which the lever is attached is very simple and powerful, and the load can be raised very easily by a slight pressure of the hand and held or lowered to any desired point. The gearing is attached directly to the engine shaft, no part of which is exposed, so that it is practically impossible for the rope or line to foul in any way whatever with the gearing, and this, we think, is an important feature which will be readily recognized by many of our readers. On the extreme left of the hoister is a winch-head which will be found very useful on board ship for hoisting sail and other purposes. This head is provided with a crank adjustment which can be used to drive a bilge or other pump. The small fly-wheel is, moreover, faced off, so that a belt can be driven from it for any use desired.

Another form of steam hoister particularly adapted to all cases where rapid work is required is shown in Fig. 6, which, it will be seen, is provided with two drums, each of which is driven by one engine and entirely independent of each other. Each drum is about 18 inches in diameter and 12 inches long, and is capable of raising 2000 pounds. As in the single hoist, just described, one lever is all that is necessary to operate each drum, and when placed on a dock or on vessels, two hatches can be unloaded at the same time, doing the work of two hoists. Owing to the general arrangement of the engine as already described, the appliance occupies very little space, compared with the amount of work that can be accomplished. Each drum in which the gearing is encased has plugs on its face which can be unscrewed and a certain quantity of oil introduced, and in this way all the gearing and internal bearings may be thoroughly lubricated, one charge of oil lasting for a considerable length of time. The hoister, as shown, is provided with two winch-heads, each of which can be operated independently of the other, and the construction of the levers for operating the drivers is the same as in the single hoist.

An indicator card obtained from a 12" x 12" engine of this type, which we had occasion to inspect, shows several interesting features, being composed of three distinct diagrams, one for each cylinder. Altogether the engine, as stated, contains numerous features of interest and value, well adapted to cause its favorable reception by manufacturers and others. We would state, in this connection, that Messrs. Dunbar & Son have prepared a very attractive illustrated catalogue describing their engine, and will take pleasure in mailing it upon application.

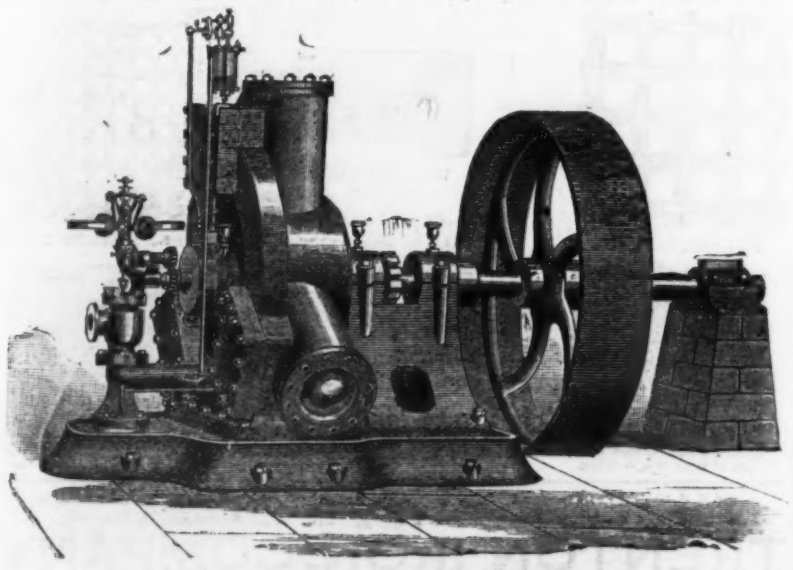


Fig. 1.—Side View of Engine Arranged for Stationary Purposes.

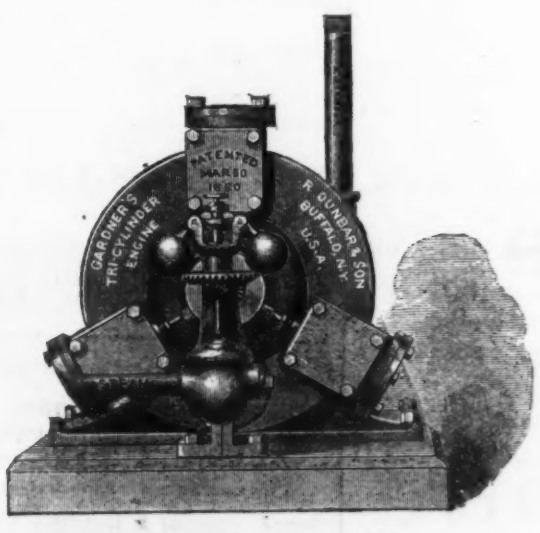


Fig. 2.—Front View of Engine.

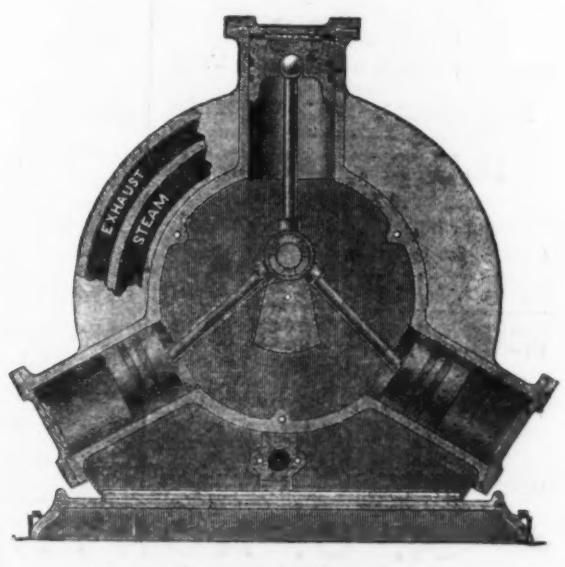


Fig. 3.—Transverse Section of Engine.

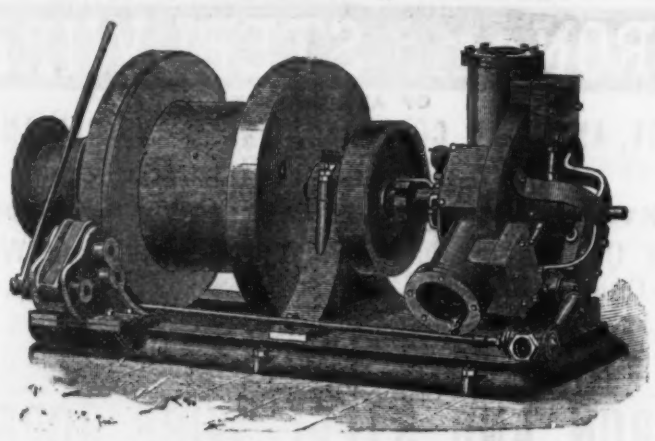


Fig. 4.—Perspective View of Single Drum Hoister.

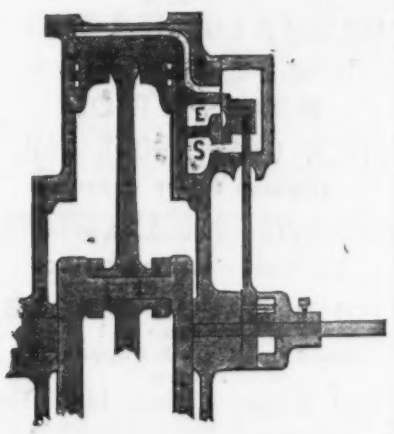


Fig. 5.—Longitudinal Section, Showing Connection of Piston to Crank-Pin and Shaft, Eccentric and Valve Motion.

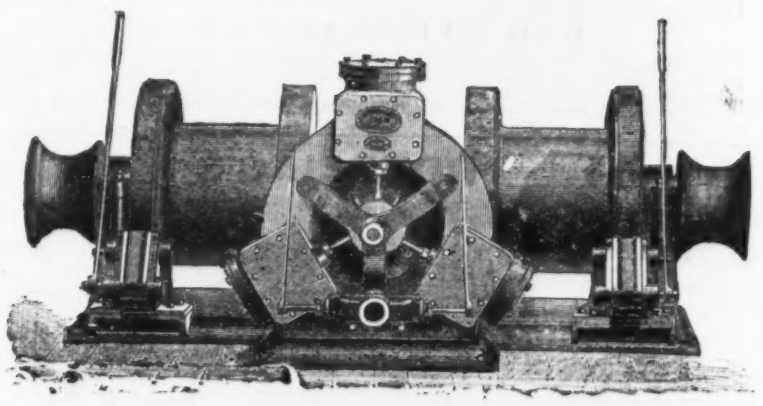


Fig 6.—Perspective View of Double Drum Steam Hoister.

GARDNER'S PATENT THREE-CYLINDER ENGINE, BUILT BY MESSRS. R. DUNBAR & SON, OF BUFFALO N Y

The Spanish National Exhibition of Mineralogy and Metallurgy.

From brief notices which have appeared in our columns from time to time, our readers have undoubtedly become acquainted with the fact that a national exhibition of mineralogy and metallurgy will be held in Madrid, Spain, in April of next year. It is perhaps needless to dwell upon the aims and values of exhibitions of this kind, as they have been repeatedly set forth in connection with other undertakings of a similar character, and we would therefore simply state that, from all reports which have thus far reached us, we think it safe to say that the most strenuous efforts will be made to insure a successful issue. The royal decree and regulations for the exhibition have been recently issued by the Ministry of Public Works, and the following particulars extracted from them will probably be of value to intending exhibitors, and to such of our readers who are interested in the enterprise:

The exhibition will be held in the Park at Madrid. It will be opened on April 1 and closed on June 30, 1883, subject, nevertheless, to such prorogations as His Majesty's Government may think fit. Mineral and metallurgic products, mineral waters, engines, tools, machines and apparatus are admissable up to February 15, 1883. Intending exhibitors of machinery of all kinds, as well as those who wish to have their exhibits in private or special installations, must demand space before October 31, 1882. All other exhibitors, those of machinery excepted, who wish space in the main gallery must petition before December 31, 1882. In this exhibition shall be admitted all such machinery, apparatus, utensils and tools (whether national or foreign) as have application to mining and metallurgy, earthenware and glass-making and the utilization of mineral waters; also the products of foreign manufactories whose proprietors prove authentically that the said products have been manufactured exclusively of Spanish minerals.

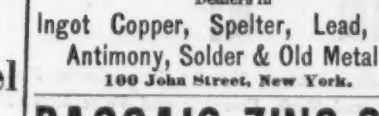
Exhibitors will be allowed gratis, as well within the main gallery as outside thereof, the space or ground required for their exhibits or machines. In the main gallery they will be allowed, moreover, gratis "show-glass" fixtures for objects of small bulk, such as collections of minerals, rocks and fossils, objects of glass or earthenware manufacture, mineral waters and books. The installation of machines, including any solid foundation work required for same, shall be at the expense of the exhibitor; but the water for steam boilers and hydraulic machinery, when not in excessive quantity, shall be allowed gratis. When steam power exceeding that of 5 horse (up to which it will be gratis) may be needed, the owners of the machinery will pay 6d. per horse-power per hour. Special arrangements may, however, be made respecting the use on a large scale of steam or water for the trial or showing at work of machinery or apparatus. Exhibitors shall enjoy the privileges of carriage, which foreign and Spanish companies have conceded for goods coming to the exhibition, at reduced rates. The expenses between the Madrid railway stations and the premises of the exhibition, and loading and unloading of goods, shall be paid by the exhibitors or their agents.

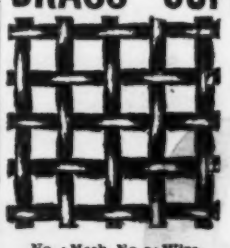
Foreign exhibitors or manufacturers who may have to remove or export again the goods exhibited shall enjoy in such cases all the advantages allowed by Chapter 10 of the Customs Regulations, in which it is provided: (*a*) The Government commissioner or the president of the official corporation who may have charge of the organization of the exhibition, or the respective representatives duly authorized, shall present to the custom house of entrance declarations of the form established for importation traffic, indicating the names of the exhibitors or proprietors of the articles or goods that may be introduced for the exhibition They shall also present a bond in guarantee for the duty, in case the goods be not exported again within the term fixed therefor. The said term will be three months after the closing of the exhibition. (*b*) The goods may be exported again through the same custom house or any other; in the latter case the administration will require from the office through which the importation took place an exact copy of the entrance declaration, in order to compare the same with that of clearance, advising this operation for cancellation of documents. The goods not exported within the term fixed, or the difference in default, as found at custom house of clearance, shall pay duty as per customs tariff.

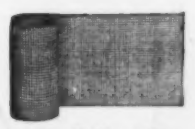
Prof. Santiago Tranor, delegate of the "Commission Ejecutiva de la Exposicion Nacional Minero-Metalurgica" for the district of Hiendelaencina, Guadalajara (Spain), will forward to intending foreign exhibitors any further information they may require.

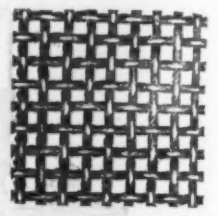
The cross-timbering method of framing car floors, in which the side sills are notched every few feet to receive cross timbers, originated, so far as we can learn, with Osgood Bradley, who was one of the first, if not the first, car builder in the United States. Like John Stephenson and several of the early builders, he was a coachmaker by trade, and his first cars were coach bodies mounted on wheels. Shortly after the first cars were built the necessity of putting several together was realized, and naturally the coach-body system of framing was the one employed. When long cars came into use the partitions between the coach bodies were removed, but the floor timbering still retained its old form. It was not until many years afterward, when the character of the strains which a car received were better understood and were found to be entirely different from those of the old form of coach bodies, that the design was changed and longitudinal timbers introduced to take the severe strains of buffing and resist the blows of collisions. Of course some of those who were familiar with the old plan of work adhered to the cross-timber system, and thus produced cars which were a fruitful source of accident. We have seen one of these cars lose its entire floor from being dragged at a speed of only a few miles an hour across old rails which had been spilled off from a freight car, as the passenger coach left the rails.

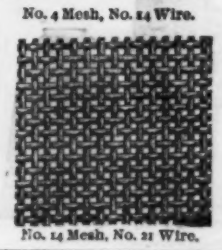
One of the chief features of interest at a recent county exhibition in Great Britain was an iron watch which had been turned out by Messrs. Crowther Brothers & Co., of Kidderminster, for the purpose of showing the extraordinary malleability of their metal. The watch is said to be perfect in every respect.

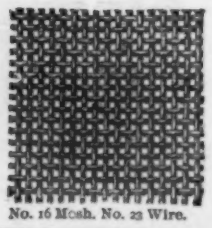


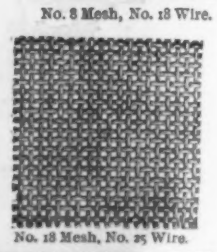












The Harrison Steel Company's Works.

In an address recently delivered before the Miners' and Manufacturers' Association of St. Louis, a very complete account was given of the basic steel plant now being erected at Harrison, Ill., by the Harrison Steel Company. The site determined upon appears to be very favorable on account of its proximity to coal fields and ore beds, from which the necessary supplies of coke and ore will be obtained. Deposits of limestone and fire-clay are also conveniently located, and the cost of transportation will probably be very low. Another important feature in connection with the value of the site is the proximity of many natural ravines of great depth and width, in which the slag and cinder and other refuse can be deposited at little cost, and surface land thus made suitable for building purposes.

The coke ovens will be situated 600 feet from the blast furnaces, and the coke will be carried to the furnaces by railway up an inclined plane to stock-houses at the rear of the blast furnaces, and thence elevated by a steam hoist to the platform of the furnaces. The six blast furnaces are placed in blocks of three, but stand in such position that each furnace can be shut down independently of the others, or relighted, and yet in no way interfere with the adjoining furnace. Each furnace is provided with three stoves, and is capable of producing 1200 to 1500 tons of pig iron per week. The ore and lime is supplied to the furnaces in the same manner as the coke. Each set of three blast furnaces has three boiler-houses adjoining one another. The two engine-houses are each 121 x 75 feet, and each contains 10 vertical engines.

The converting department is situated 750 feet distant from the blast furnaces and contains six 10-ton converters. The main building is 400 by 170 feet, and the spiegel cupola buildings are 80 by 60 feet, each containing four cupolas of the common form for melting spiegeleisen. The practice of carrying the metal in the molten state from the blast furnace directly to the converters will also be adopted in these works, thus effecting a large saving over the method ordinarily in use. There will be eight cupolas for utilizing low-cost Southern pig, and also for making addition to the charge in the ladle when on its way from the blast furnaces, so as to attain more uniform results. The converters are placed in such a position that the interior vessel can be lowered on trucks by hydraulic hoists and removed to the lining department. In the meantime a spare vessel is brought in from the lining department and is inserted in the place of the one removed, thus preventing any delay to the process of carrying molten metal direct from the blast furnaces. The lining department is 400 by 120 feet, situated in the rear of the converting-house, 90 feet distant, and is connected by lines of railway running from the hoists situated under the vessels in the converting department to the two turn-tables in the lining department. From these turn-tables a series of short railroad tracks radiate in such forms as to accommodate ladles or converter bottoms, as the case may be. These ladles or bottoms are placed upon a truck made for this purpose, and are run exactly under a fire-proof bonnet, which is supplied with gas from the gas producers. A feature of importance in the converting department is the excellent means adopted for the removal of the slag with ease and expedition by means of the cranes and slag cars. The engine building for the converting department is 150 by 108 feet, and contains four engines and six pumps. There are three buildings, 25 feet apart, for boilers, each 150 by 45 feet, located near this department.

There are three departments that receive the ingots direct from the converting department, viz.: The large merchant mill, the plate mill and the blooming and billet mill. The merchant mill is situated in a building 240 feet wide at the furnace end, and 330 feet wide at hot-bed end, the total length being 500 feet. The furnace end of the building is 90 feet from the converting house. The ingots are brought hot from the converting department and charged directly into the rear of the furnace by mechanical power, and are drawn from the front on the side next to the rolls. It is expedient that the ingots be placed in the heating furnace while yet hot, and ample heating furnace capacity has been made to attain this object; the metal is then allowed to "set" equally all through to the temperature desired for rolling. The ingot is taken from the heating furnace, bloomed, roughed and formed in a three-high set of rolls, with hydraulic lifts and automatic "turning devil." Thence it is run on driven rollers to the reversing finishing rolls, situated at some distance behind the blooming rolls, and worked backward and forward through the rolls on the floor level until it is reduced to the desired shape and size, such as angle, "tee's," square, flat or concave.

The mill has a capacity of about 400 tons per day. The plate-mill building is 150 feet distant from the converting-house, and is 300 by 210 feet in dimensions. The ingots or slabs are brought directly from the converting department hot, are charged into the rear of the furnaces by hydraulic cranes, and are taken from the heating furnaces to the rolls by an overhead track having an incline of 6 inches to every 20 feet. The middle roll of the plate train is hollow, and by means of a continual stream of water passing through it excessive expansion and contraction are avoided. There are two plate mills in line with each other, having two-high breaking-down rolls and three-high finishing rolls. The roughing rolls are 30 inches in diameter by 108 inches in length, and the top and bottom finishing rolls are 24 inches diameter by 84 inches in length, the middle roll being 26 inches in diameter. The plates are handled by hydraulic lifts throughout the whole process. Large floor room has been provided in this department for the cooling of plates, so as to put them in proper condition for shearing.

The blooming and billet mill is situated 530 feet distant from the converting-house, and is in a building 145 by 165 feet. The ingots are brought hot from the converting department on railway trucks, and charged in the rear of the furnaces and removed from the front next to the rolls. A 36-inch reversing train is turned in grooves to form slabs about 12 inches wide and 4 inches thick and upward for plates; also blooms 6 inches square or more for merchant bars of all sizes. In the case of billets for hoops, cotton ties, wire rods and other small work, the 6-inch blooms are cut by a pair of steam shears, so placed as to be fed by driven rollers, and the cut blooms pass into a 20-inch three-high billet mill, placed close to the shears, and there reduced to any size greater than 1½ inches square, at the same heat from the ingot, and are handled by hydraulic lifts while being rolled. The reversing mill is driven by a reversing double engine, and the three-high mill by a single engine.

The wire-rod mill is about 135 feet distant from the blooming and billet department, the dimensions of the building being 565 by 220 feet. The 1½-inch billets are brought on cars from the blooming department, and charged in the rear of the Siemens furnaces, which are of ample capacity to receive the billets necessary to keep the rod mills full at all times. This department is supplied with two compound rod mills, and to each rod mill there are attached two continuous roughing trains placed side by side, and driven by one engine with connecting clutch between, so that, should any repairs or fitting be required to the continuous train while in operation, the other train can be turned on and any stoppage from that cause prevented. After the billet has made eight passes in the continuous train, it is conveyed to a three-high finishing train fitted with "repeaters," and there reduced by square and oval passes alternately to a No. 5 wire-gauge rod in the usual way. The three-high train is driven by a separate engine.

The hoop, cotton tie and small merchant bar mills are situated 200 feet distant from the blooming and billet department, and in a building 650 by 110 feet. The billets are brought on railway trucks direct from blooming and billet department, and charged in rear of four Siemens furnaces, and removed in front, as in connection with the other mills, and taken to the rolls. A sunken track runs through the department, so that the product can be readily loaded on cars with the minimum of handling. The shaping shop, which is about 280 feet long and 110 feet wide, contains suitable machinery for shearing large merchant bars and bending them to any desired curve or angle. The forge department is 280 by 90 feet.

The foundry, blacksmith shop and machine shop are in three separate buildings, 30 feet apart, lying parallel to each other, the blacksmith shop being located between the two. They are bounded by the converting department on the one side, by the large merchant mill on another side, by the plate mill on the third side, and by the shaping shop and forge on the remaining side. The foundry is 215 by 120 feet. A track runs through the center into the machine shop and the roll-turning shop. There are two large cupolas situated at one side in the middle, and one small cupola at one end. There are four steam cranes, annealing furnace, two large core ovens, core benches, &c., and appliances for molding by loam, dry sand, green sand and chill molds. In one corner of the foundry is a crucible furnace and a small cupola, for melting the material for brass castings, which comprises the brass-foundry department. In another corner is a furnace for melting babbitt metal, and here the engine and mill brasses of the works will be "babbitted." Besides making all the iron castings, ingot molds, &c., required by the works, it is designed that this department shall also include steel castings in its product, not only for the needs of the works, but for the market, such as wheels and pinions, dies and hammer heads. The blacksmith shop is 215 by 90 feet, and contains two heating furnaces, one large steam hammer and two smaller ones, and a number of blacksmith forges, in addition to shears, punches, and other necessary tools. The machine shop is two stories high, the second story being for the use of the pattern shop and drafting room. It is furnished with a number of lathes of various sizes, planes, drilling machines, slotters, shaping machines, bolt cutters, pipe cutters, vise benches and other tools.

The roll-turning department is situated 60 feet distant from the shops just described, and abuts on the building of the large merchant mill. Its size is 135 by 70 feet, and it is furnished with cranes, roll-turning lathes for large and small work, and other appliances for the care and maintenance of the rolls of all the departments. The shops and roll-turning department are connected by railway tracks on the general level, for convenience in handling and removing materials in these departments. The boiler shop is fitted with all the tools necessary for the manufacture of boilers, ladles, converters, &c., and is connected by a track with the general railway running through all the departments. All the scrap metal made about the works and the rejected product of the various departments is utilized in a Siemens-Martin plant located in a building 105 by 105 feet, and which contains two 10-ton furnaces and suitable appliances for handling the ladles and ingots.

Chemical analyses and tests of the raw material used in manufacturing the steel are made in a laboratory connected with the works. In the mechanical laboratory, where the bending and tensile tests are applied, duplicates with stamped numbers are made and records kept of each specimen. The works are, moreover, supplied with 160 gas producers, constructed upon the most approved principles and furnished with coal from cars on an elevated railway. The boilers supplying the necessary steam are so placed as to obtain heat from the blast furnaces and the gas producers. The store house, which is situated in about the center of the works, is 130 feet long and 65 feet wide, and is divided into compartments suitable for holding the various stores received and distributing the supplies to the various departments of the works. The railway system consists of a track about five miles in continuous length, and is operated by small locomotives. All the departments of the whole plant are conveniently connected by railway tracks of the ordinary gauge. Raw material is brought in on elevated track 30 feet above floor level. All the moving of the material in process of manufacture is

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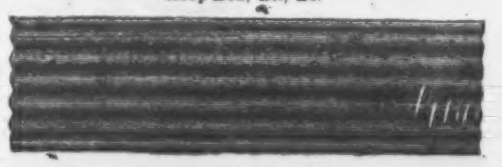

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The probable capacity of the works in tons per day of two turns is given as follows:

Blast furnaces	1,200
Converting department	1,600
Siemens-Martin department	50
Blooming and billet mill	300
Large merchant mill	400
Rod mill	200
Plate mill	100
Small-bar mill	72
Universal mill	60
Hoop mill	60
Shaping shop	
Forge	
Wire-mill department	100

Taken altogether, it will be seen that the entire establishment is arranged in a very convenient manner, and the future working of the plant will undoubtedly realize the hopes which are entertained in regard to its efficiency.

Roasting Iron Ore.

The desulphurization of iron ore, though often dwelt upon and discussed at length, is a subject which, considering the small progress actually made in practice, cannot receive too much attention. A paper entitled "Roasting Iron Ore," which was read at the recent annual meeting of the United States Association of Charcoal Iron Workers, by Mr. N. Lilienberg, will therefore undoubtedly be welcomed by many of our readers, the particulars given being of such a character as to command attention.

Mr. Lilienberg believes it only fair to admit that the effect of sulphur on iron has, in many instances, been overlooked or underrated, and in order to give occasion for forming an opinion in this respect, he submits the following facts: In charcoal blooms a quantity of sulphur so small as 0.035 per cent. is sufficient to produce cracks in the bar iron rolled from them. These cracks can be easily distinguished from those resulting from interposed cinder, because the former do not disappear by repeated welding. In puddled iron the amount of sulphur can be somewhat higher. As it is possible to weld and roll puddled iron at a heat above the point dangerous for red-shortness without burning the iron, the evil can, to a certain extent, be avoided. It may, however, be questioned whether it is safe to depend upon this, and whether it will pay to have the rolling mill running at such a speed that the bar leaves the finishing rolls at a temperature above red-shortness. In Bessemer and open-hearth steel the influence of sulphur increases as the amount of carbon diminishes. There is probably no metal so sensitive to sulphur as the homogeneous ingot metal made by the said processes with carbon below 0.10 per cent. It is true that in this material red-shortness may exist from the presence of refractory oxide of iron even without a trace, but experience has taught that the small increase of sulphur from 0.01 to 0.015 per cent. makes the red-shortness appear considerably worse.

In Bessemer steel for rails containing about 0.35 per cent. carbon, the highest amount of sulphur tolerated is considered to be 0.05 per cent. Mr. Lilienberg believes, however, that this is surpassed in many cases, judging from the cracks in rolling. In many places the ingots, having passed the roughing mill, are taken regularly aside to a steam hammer, partly for being cut into lengths, and partly for chipping out the cracked places, after which the rolling is finished at a heat above the dangerous point. The patience, labor and watchfulness in this kind of rolling ought, indeed, to be admired more than the skill.

The effect of sulphur on pig iron is to induce the combination with carbon, thereby tending to make white iron. Mr. Lilienberg is not aware that the chilling properties are thereby increased. For car-wheels there is, however, not required a pig metal already combined with carbon, but one that is ready to combine when cast against a chill plate. Mr. Lilienberg states that in almost all cases he had affirmative answers, together with regrets expressed, that no means as yet exist for a successful and cheap roasting of red-short ores.

The methods in America for roasting iron ores are simple and few, so far as they have come to my knowledge. In Eastern Pennsylvania the ores are charged, alternately with anthracite slack, into special kilns. These are composed of an upper cylindrical and a lower conical part, supported by columns. The air for combustion is admitted through three or four rows of openings in the lower shell. The columns generally stand on the floor, in order to use the entire hight under the track, thus making it necessary to lift the roasted ore into the buggies. The crude materials are discharged from flat cars on a platform at the side of the top, and thence they are distributed on the kiln as carefully as the breathing of the sulphuretic atmosphere will allow. Two kilns invented by Mr. John Gjers and Mr. Borrie, and used at most of the numerous blast furnaces around Middlesborough, England, have a close resemblance to those adopted in Eastern Pennsylvania for driving out the sulphur. The Cornwall ores, containing from 3 to 4 per cent. sulphur, are reduced to from 1¼ to 1½ per cent. sulphur, at the best, by roasting in the said kilns. With 16 feet diameter and 18 feet hight, 40 tons of ore are said to be roasted per day. About 50 per cent. of fine ore can be charged, together with the lumps. The consumption of coal slack is about 25 per cent. of the ore, and the cost of roasting amounts to about 25 cents per ton, not including the transportation and lifting of materials. The cost of erection is given as varying from $3000 to $1300. In calculations this cost is frequently given as $500, but it is questionable whether this would be confirmed by the actual cost when the kiln is completed.

In order to make gray pig iron the ore burden on the blast furnace must, from the above reason, be smaller in using sulphuric

ores, thereby, of course, increasing the consumption of coal. Apart from sulphur, it is well known that magnetic iron ores are more easily reduced in a roasted than in an unroasted state, owing to the protoxide forming compounds which are liable to melt before reducing. In Sweden the blast furnace is generally said to be able to run as by itself when the roasting kiln works satisfactorily. The author wishes to lay special importance on this, having heard the erroneous presumption that too well-roasted ore should make scaffolding in blast furnaces. That kind of ore is not too well roasted, but it is half melted on the surface, having a crude center. There is another source of loss by charging a blast furnace with highly sulphuretic ore, arising from the necessity of melting a large amount of limestone. In Eastern Pennsylvania the limestone generally used for producing a basic slag amounts to from 50 to 60 per cent. of the ore burden. The yield is from 45 to 50 per cent., the rock being silica and some basic matters. This limestone is able to reduce the sulphur from about 1.5 per cent. in the ore to about 0.10 per cent. in the pig iron.

It is stated, from a reliable source, that the following amounts of sulphur are found in the average Cornwall pig iron: No. 1, 0.035 per cent.; No. 2, 0.12 per cent.; No. 3, 0.20 per cent. Bessemer pig, No. 2 and No. 3, is considered good by the blast-furnace owners if containing 0.10 per cent. sulphur. In the Lake Superior region, where the ores are very little troubled with sulphur, an ore mixture yielding about 50 per cent. metallic iron, and containing nearly pure silica without basic matter, requires only 15 per cent. limestone for making a basic slag. This great difference cannot, however, be attributed alone to the necessity of removing sulphur, because a great part of the limestone is wasted by imperfect mixture with the ore in cases where no crushing is done. Besides the original cost of a larger amount of limestone and additional fuel for melting this, there are, of course, the expenses of a more rapid wear on the furnace lining, and the handling of a greater quantity of slag. It has been claimed, even by clever metallurgists, that a certain process of roasting is going on in the upper part of a coke blast furnace. If by roasting is meant the driving out of some part of the sulphur from the crude pyrites by simply heating, this is undoubtedly true, not only in coke, but also in charcoal furnaces, whereof the smell on the furnace top is evidence.

Some of the ores in Eastern Pennsylvania, especially those in the Cornwall district, contain copper, but generally not enough to produce red-shortness in the pig iron. It requires about 10 times more copper than sulphur for making this evil appear. This is, however, another reason for desulphurizing, as sulphur can be removed by roasting and copper cannot. The ores containing a dangerous amount of copper ought to be able to produce a native pig metal free from red-shortness, by mixing with roasted sulphuretic ores, from neighboring districts, equally free from copper and phosphorus. As the pig metal made from domestic sulphuretic magnetites is generally very low in phosphorus, it is sought for at the Bessemer works and open-hearth furnaces, where it has obtained the honorable name of "red short" pig iron. Mr. Lilienberg stated that this pig iron contains 0.10 per cent. sulphur, or more, and that only 0.05 per cent. is allowed in the ingots for steel rails, and much less in the soft homogeneous metal generally made in the open-hearth furnaces. As no steel-making process is able to remove sulphur, the steel makers are obliged to mix native red-short pig with imported pig iron in the cupolas and in the open-hearth furnaces, and to mix native red-short ores with imported ones on the blast furnaces. The general cause of these mixtures is the necessity of getting the phosphorus below the dangerous point for steel rails, or about 0.10 per cent., but there can be no question of this where the native red-short materials contain less phosphorus than the imported ones. The price of imported Cumberland pig iron, for steel making, with about 0.025 sulphur, is about $2 higher, and that of purest Swedish pig iron of about 0.15 per cent. sulphur $7 higher than the native red-short pig at the same works. The imported 60 per cent. Spanish iron ores cost about $7 at the same works where red-short 50 per cent. native ores cost $3.50 to $4, a considerable margin, even with allowance made for a difference in yield.

These remarks seem sufficient to justify two questions: 1. Is there room for improvement in the present state of affairs? 2. Would a smaller amount of sulphur in the native ores charged in the blast furnaces and in the native pig iron used at the steel works tend to diminish the importation and to stimulate domestic trade? The difficulty of obtaining uniformity in the statements was increased because it appeared that in many instances the expenses had never been figured out. The ore roasted in these kilns presents a great variety of colors, the most perfectly roasted lumps laying at the side of crude ore, so it must not be very easy to take a fair average sample for analysis. The result of obtaining ore with the half of the original amount of sulphur is, according to the author's opinion, very good, considering the way that the roasting is done. The air admitted cannot be much more than to keep the coal burning. Then the ore will be exposed to reducing gases, and, by the heat alone, the half of sulphur in the pyrites is sublimated, a great part of this, however, being deposited again at the top. Judging from the good appearance of some parts of the ore, and also from the clinkers formed by big lumps being cemented together by half-melted fine ore, it seems, however, that a local complete roasting is done just above the air holes. There seems to be formed funnels through the mass, and these having a tendency to rise straight upward, the center will be comparatively untouched. This will, of course, be still more the case where the gases are thrown out into a circular flue surrounding the top, in order to make existence in that place less disagreeable, as carried out at some works.

The impurities in the coal slack, which amount to more than the ash in the lump coals have, of course, to follow the ore into the blast furnace. To effect a clean roasting reducing the sulphur to less than one-half, there is, indeed, no other way than the use of gas. The question is to make this process sufficiently cheap and to permit of the use of fine ore. The gas has to be made in special producers where the waste gases from the blast furnace are used for driving the blowing engines. There may be a surplus of gas even for considerable times, but this cannot be counted upon for roasting. Every fit of indigestion in the blast furnace is followed by lowering of the heating power of the waste gases, and it is just on such occasions that the most completely roasted ore is required. The fuel for gas producing ought to be refuse, unfit for charging into the blast furnace. In regard to the construction of producers, Mr. Lilienberg states that an inclined plane and step-grate is about the only way of burning bituminous coal slack, charcoal braize or sawdust, and that anthracite slack may be burnt either on step-grate or in the newly introduced Wilson producer, which seems to work satisfactorily. The steam injector used in the latter can, however, be applied with equal advantage under a step-grate if the front is closed. Refuse from wood, other than sawdust, ought to be burned in a shaft, rather than on a step-grate, several good constructions of that kind being in use in Sweden. It is also well known that in that country an invention is successfully put in operation for reducing the moisture in gases from 50 to 2 per cent. by a simple process of condensation which ought to be of value in forest districts without mineral coals, where wood refuse (no matter how wet) abounds adjacent to iron mines.

In regard to the construction of gas-roasting kilns for sulphuretic iron ores, there is not a very great choice. Not counting experiments, there are, in fact, only two in actual use. The Westman kiln, used at most of the Swedish blast furnaces, and the Taylor kiln, operated in America, have several times been described and criticized; it would therefore be superfluous to repeat more than the general features. The Swedish kiln, with its large space for preparing the ore before the final heat is applied, can, by single roasting, bring down the sulphur below 0.05 per cent. from about 2 per cent., which result can hardly be obtained by any other kiln. On the other hand, the cost of erection is very high, amounting to about $8000. The cost of roasting is about 50 cents per ton for single and $1 for double roasting. The double and even triple roasting, by picking out the half-roasted lumps, is frequently used in Sweden, in places where a very low amount of sulphur is required—for instance, at Bessemer works making soft metal. The consumption of gas in these kilns is estimated to be about one-third of the whole amount produced in the blast furnace. The capacity of a kiln with six doors is about 40 tons per day.

In the Taylor kiln, with its short space above and large space below the gas inlet, sulphur is generally reduced from 2 to 5 per cent. down to 0.25 per cent.—sometimes to 0.10 per cent. The cost of erection is $1800 to $2000, or about one-fourth of that of the Westman kiln. The hight for lifting the ore is about the same. The consumption of coal, which is an important item where the waste gases from the blast furnace cannot be used, is reported to be as low as 1 cwt. lump anthracite per ton of ore—that is, 6 per cent. The inventor is now building another roasting kiln with smaller thickness of walls, thereby reducing the cost, the hight also being reduced from 33 feet to 30 feet. The fuel will be anthracite slack burned in a Wilson producer.

A third kind of kiln, invented by M. Dillner, has been recently put into successful operation in Sweden. The principle is that of the Siemen's regenerative system, two chambers filled with bricks being erected on each side of the kiln, the flame running horizontally through the ore. The sulphur has thereby been reduced from 1.1 per cent. to 0.12 per cent. The natural objection that the regenerators should be filled by ore dust and the bricks thereby become glazed and ineffective, appears not to bear out in practice. Mr. Lilienberg has not yet data about the costs of labor and erection, but it seems that the cost of a Dillner kiln should be higher than even that of a Westman kiln. The regenerative system ought to be capable of reducing the consumption of coal very low, which, indeed, would be of more value for foreign works with their steam-power than for the Swedish works with their water-power. In these kilns, only lump ore can be roasted. For desulphurizing fine ore, there is no gas kiln in actual use. It is needless to repeat that the fine ore accumulating on the banks of many iron mines is enormous. In the stock-house at a blast furnace there is generally more fine ore than wished, the amount being increased for every unloading, and the ordinary way of disposing of this is to put as much of the fine ore in the roasting kiln as possible without breaking off the circulation, and to charge the balance in a crude state in the blast furnace or as much as the regular working will allow. To roast fine sulphuretic ores is an easy thing. To roast it so that the labor does not raise the final cost of the fine ore above that of lump ore is very difficult.

In summing up the requirements of a roasting kiln for sulphuretic ores, they seem to be about as follows: 1. The sulphur shall be reduced by single roasting from 3 to 4 per cent. to 0.10 per cent. 2. Fine ore and lumps have to be roasted together, as they come from the mines, without any extra expense for separation. 3. The cost of erection for a kiln roasting 50 tons of ore per day shall not exceed $2000, which, of course, ought to stand in some proportion to the price of the ore. 4. The cost of roasting shall not exceed 25 cents per ton. 5. The hight shall not be greater than the space below the track in the stock-house, or about 18 feet, in order that elevators may be avoided and hopper cars used for direct unloading, which makes the labor considerably cheaper than the use of flat cars. 6. The repairs, removal of clinkers, &c., shall be cheaply and easily effected. It must be admitted that these limits leave a very narrow margin for inventions, but Mr. Lilienberg has tried what could be done in that direction, and hoped to be able to submit, at some future date, the details of construction for a roasting kiln, provided that experience

should corroborate what seems probable. Although the remarks submitted are incomplete, it is not unlikely that they will be continued by others, and the adoption of such a course would undoubtedly contribute to dispel the indifference and one-sided views which have for a long time checked the advance of this part of metallurgy, while many other things are being vigorously pushed forward by American iron and steel makers.

The Flying Machine of the Future.

In the December issue of the *Atlantic Monthly* a contributor discusses the flying machine in a highly entertaining manner. His remarks will be found readable, whether we agree with the feasibility of the suggestions or not.

I know little or nothing, perhaps, of the flying machine of the future, but I am well convinced that the balloon must be abandoned. To think of either safety or success in the basket under the gas-bag is absurd. Wherein will be the value of the successful flying machine but in the rapidity and precision of its flight? Unless we can fly swiftly and surely from point to point, why fly at all? The bulk of the balloon—the one property which has endeared it to a cowardly race, and prolonged its existence thus far—is a sufficient and peremptory reason for discarding it. You cannot propel it any faster than a canal boat in any direction, nor against the wind at all, and no change in its form can ever surmount the fatal objection. But if we give up the balloon, and try to fly as the living bird flies, what then? Say that we make the body of our bird of the compactest and most symmetrical shape for cleaving the air with the least resistance, and trust to the beat of its wings to sustain its weight—as who doubts we may?—still, how are we ever to launch it, and carry it successfully over the neck-breaking period of its existence? For let us not belittle the difficulties which await the inventor of the Bird. Inventions have sometimes come like a flash to a man. They have been complete from the moment of their conception. When once the happy thought has come, there has been nothing further to do but to make the thing and set it going. But, in the nature of things, the Bird can never spring fully fledged from the brain of any man. However completely it may be conceived, there must still be a time, and probably a long time, of experiment and adjustment, interspersed with numerous failures and discouragements.

The expense involved in successful aeronautics will be not merely in the building of the Bird, even supposing it could be complete and satisfactory from the first. There will be a permanent plant required for its operation, entirely independent of the cost of building. We have not merely the Bird to construct, but we have its operator to instruct. We want a contrivance to sustain the Bird in its first weak and awkward attempts at flight, just as the toddling infant must be upheld when it begins to walk, only that in the case of our Bird the need is far more imperative. Nor is it merely in the experimental stage of flying that this apparatus will be required. We may well admire the sustained flight of a bird, especially a large one, as the ideal of easy and graceful motion; but when we see that bird rise from the ground, or from the surface of the water, we witness the most difficult and laborious of animal movements. It is to be expected that our Bird, being in that respect not so well equipped as the living animal, will at every flight need some help in mounting. For obvious reasons, it must be made as light in every part as is consistent with safety. Think, then, of a paper boat, for instance, with wide-spreading wings and a windmill behind, going through the air at a speed double that of the fastest railway train, and coming to the ground without serious accident. Our sending-off apparatus must be also a catching apparatus, and will be at no time more needed than when receiving the returning voyager of the air after its journey is done.

At least three forms of the sending-off apparatus suggest themselves. The idea of the first, and best, is as simple as can be. An upright pole; a gaff, extending outward and upward from the base of it, and forked at the lower end to fit the pole and revolve around it; and a suspending cord from the top of the pole to a point near the outer end of the gaff, will represent the whole arrangement. If now we hang our Bird by a string to an outer end of the gaff, and carry this rapidly around until the speed of flight is attained, the Bird being at the same time accurately balanced, and its flying mechanism in motion, we may slip the string and release it, and it will be able to sustain itself and steer away in safety. But for the use of a Bird capable of carrying men, and therefore of some practical value, our contrivance is imagined on too small a scale. The pole for our purpose must be a tower, high and strong, and our gaff a boom of elaborate construction, say of tubular iron, braced laterally to prevent its swaying to and fro, and suspended, not by a single string, but by a series of stays distributed along the length of it. The tower must have a circular base, with a carriage fitted to travel around it and carry the inner end of the boom, and within the tower a steam-engine or other motor to drive the boom around. We must have a tower, say 200 feet high, and a boom that will sweep a radius of 250 feet. With a boom reaching out 300 feet from the center of the tower, or describing a circle of 600 feet in diameter, we should traverse more than a third of a mile at each circuit; and at five turns per minute, a speed of more than 100 miles per hour would be attained by the outer end of the boom. This would certainly be fast enough for our purpose. Now, if we had our Bird suspended from the boom by a cord of sufficient length to allow it considerable freedom of movement, and with a contrivance by which it could be instantaneously released, we should be ready for flight.

Impelled by the engine in the tower, the boom begins to revolve, carrying the Bird with it. The mechanism of the Bird is set in motion, and it begins to flap its wings for self-propulsion; only at first the propelling instrument will probably be a propeller wheel instead of wings. The steering apparatus of the Bird must, under the command of its operator, be for the time adjusted to the circular path of the boom. As the speed of the Bird increases, and it begins to feel the lifting power of the air beneath its extended wings, the weight which the boom sustains is proportionately reduced, and the boom at length becomes rather the companion than the carrier of the Bird. This process may continue until the whole weight of the Bird is actually carried by its own wings, and the suspending cord hangs loose. When that first occurs will be a notable moment in the world's history. Without risking our necks, we have brought the bird to the act of self-sustained and independent flight. From that moment the art of flying is an accomplished fact, and all needed improvements for safety and practical success will swiftly and surely follow.

When our Bird thus becomes demonstrably able to fly alone, we must be in no haste to release it. Careful and protracted trials should be insisted upon, and a minute inspection of every part of the machine. The boom should be revolved and the Bird flown in both directions, that the whole range of its steering powers may be proved. Another and more vital point must not for a moment be lost sight of. The operation of alighting must always be a more dangerous one than that of mounting, and every possible facility must be provided for it. Next to the net, or hook, or other catching device to be furnished at the end of the boom the most necessary point to be secured is such a command of its movements as will enable the engineer of the boom to co-operate with the Bird, and place his machine in the right place at the right time, and give it motion at the right speed. The Bird must have full control of its course, so as to steer itself perfectly—not necessarily with sudden sharp turns, nor in the shortest curves; but it must be able to fly high or low, to turn to the right or to the left, and to go in a circle in either direction. When ready to alight, it will approach the tower by a circular movement, coming nearer and nearer as carefully as possible. The engineer of the revolving boom must regulate its speed and position exactly to the movement of the Bird, and at the precise moment be ready to hook on; and until that can be done with certainty there is no safety in flight and no room for exultation.

Thus far, in the high tower and the revolving boom I have proposed nothing which is not easily within the scope of contemporary engineering skill. Such a tower as that now standing at Coney Island would be tall enough and strong enough for our purpose, though its form is not the best possible. It would, of course, be necessary to have the land unobstructed by trees or buildings, to give the Bird room to mount. When our instinctive ideas of danger can be readjusted to the case, and we realize that it is no more fatal to be killed by falling into the water than upon the land, a small island, with a wide reach of water around it, will be our ideal location. What better site can be found than that selected for the long-promised statue of Liberty Enlightening the World? In the second form of the apparatus proposed, the high fixed tower might be dispensed with, and the revolving arms mounted upon a turn-table, like a modern draw-bridge. The cost of this arrangement could not be much, if any, less than that of the tower, and there is no other apparent reason why it should be preferred. A third form of apparatus would be that of a car upon a circular railroad track, of which I care to say but little, as it could be of no practical value.

It is not my purpose here to say much of the Bird itself. It is not to float, but to fly, and its whole build must accord with that idea. Its speed, and not its levity, will sustain it. In the balloon we increase the bulk as much as possible, and its shape makes little difference; in the Bird we reduce its body to the smallest compass, and to the shape that will offer least resistance to rapid motion. If it is ever to carry a man, he must be entirely inclosed within it, and windows provided, through which everything may be seen and its course directed. As in land travel we have never yet been able to make machines that will walk with the leg movement which animals use, so we shall probably not be able at first to propel our Bird by the beat of its wings. The wings will, however, still be needed, as the resistance of the air against them will be the chief sustaining force. As the wings will be at the back, or rather top, of the machine, and the weight of the body and contents below them, the Bird will always be in stable equilibrium; and so long as propulsion continues, and the power to sustain the weight by the speed of flight is maintained, there will be no danger of its rolling over. It may be found that two pairs of wings will be better than one. The means of propulsion may be a fan-wheel at the stern, similar to the propeller in water. As to the motor, we must say that steam is not yet superseded; but when steam is suggested, let no one think of a locomotive or a steamboat coursing through the sky. That is not putting it fairly. Our Bird will be of a very different breed. Its framework will be of the lightest material, and as steam engines have already been made which, with the boiler, weigh only 20 pounds per horse-power, this may be further reduced. The strong current of air against the breast of the Bird will be a powerful condensing agent, and the water can be used over and over. The condensing tubes could serve for the framework of the machine, and thus add nothing to its weight. Many details of the Bird can be determined only by experiment, and experiment waits for opportunity. The Bird will steer easily. In its flight there will be practically nothing outside it to change its course; and if it be symmetrical in shape and the propelling force axial, as it would be with a single wheel, a slight hint of the rudder will direct it. When flying in the circular path, starting and alighting are the only occasions that will seriously try its steering capacity. The ability to fly in the circular path, which is required when the Bird is suspended from the rotating arm, being a guarantee of its steering powers, will also imply a propulsive force much more than enough to sustain it in horizontal flight, as it then has the centrifugal force as well as gravity to overcome.

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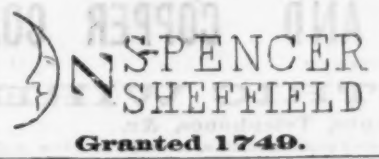

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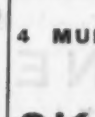

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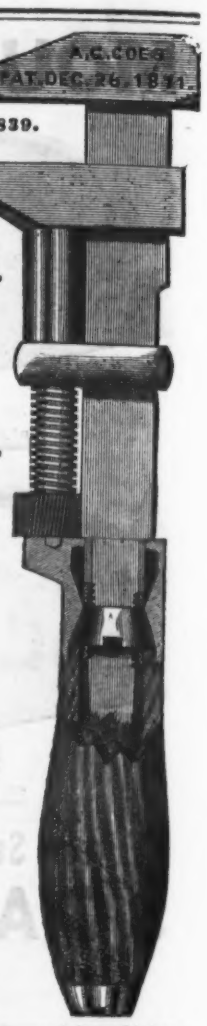

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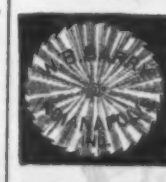

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No one can fail to be struck with the great amount of brasswork used in decorating modern houses. We find it everywhere; indeed, the frequency of its appearing almost recalls the days when hammered brass and repoussé were the glory of gold workers, who did not disdain to exercise their skill upon the baser alloyed material. There is a very close connection between bronzework and brasswork, but whereas the former, fashionable as it is, is mainly the work of foreign artisans, under the direction of French and Belgian principals, the latter is daily becoming more successful as an article of domestic manufacture. The reason of this is obvious; most of the ornamental brasswork upon stoves, fenders chandeliers and articles of the same kind can be manufactured in great quantities, and after the models are once made the process becomes mechanical, whereas the perfection of bronzes lies in the artistic finish given to each individual piece. The skill necessary to the perfecting of original conceptions is still in its infancy here, while in many European countries it is an absolute inheritance, and the art of working in bronze and in brass is handed down from father to son, and in the same way the details of composition are often family secrets. In England the the greatest perfection is attained in "hammering" brass—that is to say, in making shaped articles out of a single piece of metal. For instance, the brass coal-scuttles which play so important a part in the parlor decorative furnishing to-day are almost all of English manufacture, the American artisan having at present succeeded only in producing an article made up of several pieces not being artistically joined together. In the same way the very fine gauze work of which brass screens and shades are made is generally of French origin, and has, so far, found no perfectly successful imitators upon this side of the Atlantic. It is very difficult to imagine where the use of brass in decoration will stop; it has so very much to recommend it that it is no wonder that it is becoming more and more popular, and that it is to be met with alike in the homes of the wealthy and the small apartments which are at the command of persons of very limited income. The adaptation of this material to the decoration of the open fire-grate is one of the most noticeable incidents of this popularity. In dwellings of really moderate rent the ornamental stove will be found in the best rooms, and in nine cases out of ten it will have brass fixings, an ornamental facing in open brasswork, and in all likelihood a fender and andirons of the same material.

There is a large field of possibilities in decorative brass; such a grate, with all the fixtures complete, may cost only $50, or it may be worth thousands. Much depends upon the material itself, the extent to which it is alloyed, but more to the education and skill which has been expended upon its manipulation. Nothing can exceed the cheerful aspect of the open fire-place, with its fittings of burnished brass. There is but one drawback to it, and that must, unfortunately, be admitted by all who have had long experience of it. Days—cold, biting, wintry days—will come when it will not throw out heat enough to thoroughly warm a large room. Every one is familiar with the stereotyped British interior. In the land of fogs, where stoves and furnaces are alike looked upon with disfavor, and where the family circle upon a bitter winter night is close around the blazing fire, impartial observers are forced to concede that with all its beauty the open fire sends as much heat up the chimney as it does into the room. That while the cozy arm chair, drawn within the immediate influence of the blaze, is radiant with heat, the far corner of a spacious room will be of the temperature of Siberia, and the hallways and passages of the house enough to make a cat shiver. Something—nay, much—is done in English houses to increase the heat of open fires by the use of steel facings and fenders as reflectors and radiators of heat, and very effective such additions to the stove are; indeed, with their aid the seat in the cozy arm-chair may become so very warm that screens will be needed to shield its comfortable possessor from the fierceness of the blaze, and what steel does in English drawing-rooms the judicious use of brass and tiles may accomplish for us. Open fires, let it be said, with all appreciation, need just such aids, and just in proportion as they are given by the adjuncts of the grates will they increase in popularity. In this country the heating of dwelling-houses becomes an absolute necessity in many localities; the furnace or the steam boiler are as much a part and parcel of home comfort as the stove itself, and that being the case there is no reason why the open stove should not carry the day, and by all appearance it is likely to do so; and yet in many respects it is inferior to the porcelain stove of Germany. It is all very well to laugh at the monumental character of the favorite heater of that philosophic country, and to recall the remark of the Englishman who admired the affectionate tribute to the departed members of the family as shown by the monumental erections in the dwellings, but the fact remains that nothing is at once so effective, so cleanly and so satisfactory as a means of warming apartments as the closed porcelain stove. It gives out an enormous heat, can be made up and left for hours, and makes neither smoke, dirt nor disagreeable odor. So much for the stove of Germany, after which digression we can cheerfully admit that in point of apearance it cannot compare with the latest open stoves of America, with their brass decorations, polished tiles and burnished appointments, to say nothing of the latest form of decoration in the introduction of raised enamel work.

There is much that is of interest in the manufacture of the brass which plays so important a part in our midst. It is in reality a composition made up of copper, zinc and lead, and its value depends very largely upon the extent to which such material is represented in its make. The copper used for the purpose by most of the New York foundries comes principally from the shores of Lake Michigan, reaching the consumer here in the shape of ingots, which can be molded and used in the condition in which they are received. The most ordinary piece of ornamental brasswork has passed through seven processes before it is ready for sale. After the design has been furnished, a cast is modeled in plaster of Paris, and it then passes to the molder, who casts it in metal. The filer then works upon it and rids it of all imperfections and unevenesses, when it is ready for the chaser. The article, whatever it may be, probably consists of various parts, which are now brazed together with hard solder and forwarded to the filer once more, and then to the polisher and colorer. In this way the commonest article made of brass is perfected, while what is called "shell bark" is more elaborate. This is spun upon a block known as a chuck, and requires very skilled workmen. The copper is first cut in sheets and placed over the block on a lathe, and as the lathe revolves the workman with a steel instrument molds the metal into the required shape until it is perfectly fitted on to the chuck. The highest rate of speed is necessary in thus welding the brass on to the model, and lathe and chuck revolve with the greatest rapidity. In this way knobs and balls of brass are made, such, for example, as form the base of chandeliers or the top of pedestals. The ornamental open work with which we are familiar upon the chains of chandeliers, or that which has the appearance of half-relief, is made by a still more difficult process, known as half-scouring, and for this branch of ornamental brasswork competent hands receive high wages. In some of the wealthy houses of New York the most beautiful brasswork may be seen. Very often it is intermixed with and relieved by open ironwork or bronze, but it is, as every one knows, entirely different in effect; it is so bright and so susceptible of polish that it is introduced with increasing favor. Embossed sheet brass is used for finger plates to doors for panels, and for the decoration of flat surfaces in almost every position. Brass plaques shine resplendently upon the walls, hammered brass salvers replace those of silver or electroplate, and in domestic utensils of every kind brass is used for the exterior.

It has been asserted that the revival of the art of sheet brass repoussé work is due to the encouragement given to pupils in all kinds of hard work in a school in Philadelphia, and it seems quite certain that the taste, once inaugurated, will increase. Some of the most beautiful decorative brass articles are unquestionably those which are popular accompaniments of the grate—andirons or fire-dogs for example. These are now made in every variety, expensive and inexpensive, merely upright posts ornamented by a ball or by the unextinguishable sunflower or elaborately carved images of animals on the faces of objects. Perhaps a still more popular form of brass ornamentation is the fender with its twisted bars and radiating knobs, as costly in its way as the ordinary cut-brass fender is inexpensive. After all, what a responsible agent fashion is! Public taste in England a while ago demanded that these very brass fenders should be relegated to the attics. Even the second-best bedroom would have none of them, and here they are again triumphant. Housemaids should look upon them with more favor than upon the polished steel which drove them into temporary obscurity, for they do not call for half so great an expenditure of energy in polishing. Indeed, brasswork is very easily kept bright. The brass knobs to doors which are again to be seen in luxurious homes recall those in old-fashioned country towns in England, where a most important part of the maid's work is the polishing of the door handles, knockers and brass plates. Brass knockers are as yet not found here in any quantity, and yet they are essentially decorative and certainly handsomer than many atrocities in iron which have replaced them.

It is often very strange in comparing the every-day life of cities to find how important little things become and how seldom people notice them. In that very matter of knockers, how universal they are in London, how unusual here! "Every morning, sure as the clock," runs a popular London melody, "somebody hears the postman's knock," and so truly in fashonable quarters the squares reverberate every noon with the rat-tat-tat of the footman. How odd it would seem to a Londoner to listen to the postman's whistle, how strange to a New Yorker to have every nerve beat at the distinct double rap which should announce the coming of that longed-for mortal! And the hideous construction of some of these London knockers, grinning heads, or griffins, or other atrocities, make us grateful that here they are not perpetuated, and keenly sensible of the great gain in point of beatuy when they are made of brass. Then, indeed, they serve a distinctly decorative purpose, and might become popular if only for the sake of appearance.

Now, more especially, brass is desirable since it is possible to polish it without hand-burnishing. It has taken many experiments, many failures and much patience before it has been feasible to communicate a highly-polished surface to the material by the use of artificial means, but now that it has been accomplished, an immense impetus has been given to the trade in brass. It would be impossible to call to mind even a quarter of the beautiful things now manufactured in this material, but a few of them are familiarly known to every one of us. Lamps, for example, the latest style of which is found in spiral columns of burnished brass, surmounted by a globe. Chandeliers in the center of the room are no longer fashionable in very luxurious dwellings, but until the electric light completely banishes gas from our midst they will be found in the majority of homes. The brass used in their construction differs from that employed for articles which need constant polishing, such as the facings of stoves, andirons, &c., in the fact that it is lacquered, or polished with a fine composition, which gives it additional luster, but would not stand any very frequent

polishing. Occasionally the brasswork of chandeliers is relieved by the admixture of cut-glass drops or stars, and every possible combination of porcelain and brass ornamentation is found in gas fixtures and fittings. Frames of wrought iron or of ebonized or carved wood are fitted with the finest brass wire, which is almost as fine as spun silk, and which is often very beautifully decorated with a center of repoussé work. Embroidery is mounted in frames of hammered brass, and beautiful effects are produced by its introduction in the fitting of colored glass for medallions, circlets, screens, and even mosaic window margins. Rods of polished brass are found upon the carved upper mantels of large houses, and in the midst of dark wood fittings for book-cases, library shelves, and even stairways, brass, with its lightning gleam, is found. A novelty in door-handles has been introduced in up-town houses in those made of wrought brass in the shape of shells, an idea which is certainly practical, and should prevent much splitting of gloves on the part of those to whom small sizes in kids is a matter of moment.

Brass has long been subject to most elaborate workmanship in far Eastern lands. Probably with all our progress we shall never achieve results which can compare with those which excite our marvel as the work of untaught hands. There is something in the free, untrammeled design of Eastern repoussé work which seems forever to escape the artistic workman of the Western hemisphere, and the exquisite specimens which have come down to us of mediæval conception and execution owed their origin to stray samples which found their way from Asia into Southern Europe to take an individual expression in the hands of artistic workers. The great difference in the modern application of this truly decorative material lies in the fact that it is used by us in combination with so many other things. It is no longer left so entirely to its own merits, excepting in the case of certain articles such as scuttles, fenders or plaques. In other cases it serves the double end of being in itself decorative and enhancing the effect of other decorative materials. So in its use with woods we find it equally effective with light and dark colors. As a finish it harmonizes with both, and in many of the most expensively fitted stores on Broadway plays a most important part in lighting up the general aspect of large interiors. In many offices trellis-work of brass forms the separating line between the desks, and it often is the agent of ornament upon each landing in the shape of the elevator door. Brass railings are found on the staircases, brass rods on the window-fittings, brass wire as curtains, and no material that has become suddenly popular better illustrates the increasing demand for decoration in modern houses. Tenants expect bright and cheerful surroundings, and in spite of the constant outcry against the apartments and dwelling-houses of the city, the fact remains that they are becoming steadily brighter and more decorative in all the details which represent finish and style. This is very largely owing to the fact that brass is so inexpensive and can be so universally employed in ornamentation; but perhaps people are scarcely alive to the great difference that really exists between houses erected some 20 or 30 years ago and those which are springing up upon all hands to-day. Improvements may still be needed; they certainly are, but justice compels us to admit that much is done in new buildings to-day to make them pleasing and attractive, and that in this we find a striking evidence of an increasing demand for cheerfulness and beauty in home life.

Patent Office Proceedings.

From the report of the business of the Patent Office for the fiscal year ended June 30, 1882, recently submitted by Commissioner of Patents Marble, it appears that the number of applications for patents received amounted to 27,622. The number of design patents applied for was 854, while the number of applications for reissue patents was 407; 737 applications were made for registration of trade-marks, and 442 for registration of labels, thus making altogether 30,062. The number of caveats filed was 2455; the number of patents granted, including reissues and designs, 17,713; the number of trade-marks registered, 1079, and the number of labels registered, 223, making a total of 19,015. The number of patents withheld for non-payment of final fee was 1673, and the number of patents expired, 5123. The receipts of the office from all sources were $930,864.14, while the expenditures, not including printing, were $651,719.50, leaving a surplus of $279,144.64. Owing to the absence of an appropriation to continue the work of the abridgment of United States patents, such work was discontinued on August 1 of this year, and the manuscripts which had been prepared were carefully arranged, put in boxes and stored away.

Complaints have often been rendered with regard to the fact that more than one patent is issued for substantially the same invention, and while it is probable that such mistakes would occasionally occur, even with a proper abridgment, the number of cases would naturally be much less than it is at the present time. Respecting necessary legislation on this point, Commissioner Marble says: "It is provided that upon compliance with the terms of law an applicant may have a patent for his invention, if the same has not been in public use nor on sale in the United States for more than two years prior to the filing of his application. It is necessary that an applicant should establish to the satisfaction of the Commissioner of Patents that his invention has not been in public use nor on sale for that period, before he can receive a patent. In *ex parte* cases this is now done by his oath. It not infrequently occurs, however, that the attention of the office is called to the fact that inventions have been in public use or on sale for more than two years prior to the filing of the application. Unless this information is within the knowledge of an employee of the office, or is voluntarily produced by some person having knowledge of the fact, there is no way by which proof of it can be obtained. In interference cases the fact of such use or sale is frequently brought out, although not strictly pertinent to the issue. Some provision should be made whereby, at the request of the Commissioner or of a party in interest, a subpœna could be issued, as in contested cases, to compel the attendance of witnesses to testify as to the use or sale of any invention for which an application for a patent is pending in this office."

Commissioner Marble remarks further: "In my opinion, the terms of patents issued by this office should not be rendered uncertain by the operation of the laws of any foreign country, nor by the failure of the patentees or their assignees to do what such laws require. If the patent for an invention which has been first patented in a foreign country should be limited in its term, I think that a definite term should be fixed, and a time within which application must be filed in this office after the issuance of such foreign patent be prescribed. In view of the fact that the terms for which patents may be granted in foreign countries are shorter than that for which they may be originally granted in this country, I think that twelve years would be a proper term for patents where the invention has first been patented or patent applied for in a foreign country, and that the applicant should file his application within two years after the issuance of such patent or application therefor. I desire also to call attention to a recent decision of the Supreme Court of the District of Columbia, in relation to the registration of labels. Application was made for the registration, of a label, which was rejected by the examiner because it was not a label but a trade-mark. Thereupon a writ of mandamus was sued out against the Commissioner to compel him to register what the applicant claimed to be a label. The Court held that the Commissioner of Patents has no discretion in the registration of labels. If an applicant comes with a trade-mark, calls it a label, and asks for its registration and pays the fees required by law for the registration of a label, it is the duty of the Commissioner to cause it to be registered. I still think that the practice of the office in relation to the registration of labels and trade-marks is correct, notwithstanding the decision referred to. If the decision of the Court, however, is to be followed, legislation should be had which will remove every question of doubt in relation to such registration."

The New Russian Tariff.

According to the St. Petersburg (Russia) correspondent of the *Ironmonger*, the receipts of the Russian customs for 1882, up to August 1, give a total of 56,125,398 s. r. (1 s. r. = 65.8 cents), being 13,838,061 s. r. more than for 1881, and 329,596 s. r. less than for 1880. From July 1 there is shown a considerable decrease in the imports, the increased duties having commenced on that date. The imports and exports are given only to July 1, so that the figures are comparatively larger for all goods, every one, as a matter of course, having endeavored to clear his goods in June. The imports of the principal articles in metals are given as follows to July 1:

	1881. Tons.	1882. Tons.
Pig iron	120,000	110,000
Bar iron	39,800	47,020
Plate iron	16,000	21,000
Scrap	160	1,615
Iron rails	480	500
Steel rails and steel	3,600	2,050
Steel sheets	1,050	67
Scrap steel	9,300	4,570
Coals	665,000	1,050,000

After July 1 the importation of bars and sheets in steel and iron almost ceased. The iron rails imported have been small sections, and the falling off in scrap steel arises from the rail mills being without orders. The importation of coals increased, in consequence of the expectation of a duty being levied of about 50 cents per ton. During the same time the exports have been enormous, in comparison with those of 1881, and the quantity of iron exported this year was 1500 tons, as against 900 tons last year.

The Iron Mountain of Austria.

A correspondent of one of our English exchanges, in dwelling upon the trip of the British Iron and Steel Institute through Styria, gives a very interesting account of the Erzberg, a mountain of iron ore of a very rich nature, which is bounded on the south by the valley known as the Munichthal, and on the north by the Untererzberg. The Erzberg has a very peculiar history as an iron mountain. It is about 4870 feet above the sea level, and the richest ore is found near the summit, the stone being actually quarried from the face, instead of mined. Ironstone is also found in the lower portions, but it is not so rich, and the supply at the top is so unbounded that attention is chiefly directed to the high-grade ore. No exact data are in existence as to the length of time during which the mountain has been worked. From all appearances it was well known to the Romans, and is mentioned by Pliny, Tacitus, Ovid and Horace. The exact period at which it is known that operations in search of iron were resumed was in the year 712, and ever since then, as necessity required, it has been drawn upon to meet the requirements of the time. How long it may yet last it is difficult to say, but, at the present rate of consumption, it is thought that the supply will not fail for a number of years to come. In former days the mountain was divided between a number of individuals, who carried on independent operations, but their efforts were so unsuccessful that the Emperor Ferdinand II., in 1625, managed to effect an amalgamation. Little progress was made, however, as the workmen had neither the tools nor the means at their disposal which we now have, and what ore they took out was by means of drifts, many of which are still to be seen. In later times the folly of so many different interests became apparent, and finally a large company was formed to carry on operations. Their labors have been crowned with considerable success, and the output of ore is now about 1200 tons per day. Owing to the unfavorable weather during the winter, operations are carried on only from about May to August, and the winter supply is stored in sheds in the valley below.

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AND

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The Outlook for Iron and Steel.

There is no denying the fact, that so far as prices and orders for the future are concerned, the iron and steel industries of this country are not in as prosperous condition as they were at the beginning of the year, with the exception of nails, and possibly one or two other minor products of the iron trade. All iron and steel is lower than it was in the spring. Steel rails, the whole country knows, have been sold at $40 at the mill in some cases, making $42 at tide-water, and there seems to be no difficulty, even in the interior, in getting rails at from $43 to $45 per ton, as against, say, $54 to $57 the first of April. Bar iron is selling in the West at 2¼¢, as against 2½¢ the first of April, while pig iron is $2 or $3 off from the prices ruling at the same time. Nails, as we have indicated, are about holding their own, the price now being about the same as in the spring. While these rates are the ruling quotations, it is also true that in most cases the mills are not suffering for orders for present employment. Old orders have not yet been fully completed, and the current demands keep the mills fairly busy; but at the same time orders for the future are not being placed in any great amount except at somewhat low prices.

Evidently there is a disturbance of the hitherto existing relation between production and consumption. In 1878 the production of Bessemer steel rails was a little over 550,000 tons; in 1881 it was something over 1,300,000. The completed capacity of the Bessemer mills for ingots in 1880, according to Mr. Swank's statement, was 1,250,000 tons; in July, 1882, it was something over 2,000,000 tons. Of course, with the great advance in railroad building that came with the "boom," and the small capacity of the American mills at that time, rails were brought in largely from abroad, and it is well known our Bessemer mills immediately went to work to largely increase their capacity. This increase has been accomplished and the mills are now ready to make the rails, while the demand for them has somewhat fallen off and the result is low prices. At the same time this very large capacity and production of the Bessemer mills has not only resulted in reducing the price of rails, but has served to keep the price of ore and pig iron high. The capacity of the Bessemer steel mills in this country the present year for the consumption of pig iron is fully equal to the entire make of pig iron in the country in 1875 or 1876. The pig iron for Bessemer works must be of the very best grade, requiring the first quality ores. The first parties to make their contracts for ore for the season's delivery are generally the Bessemer steel men who make their own pig iron, and the contracts are generally very large. This keeps up the price of ore, and with it, of course, the price of pig iron, not only to the Bessemer manufactories, but for foundry and rolling mill purposes; and, while it may be possible that the price of pig iron is not higher than it should be relative to the price of ores, it certainly is higher relative to the price that bar iron sells at than it usually is.

A state of things somewhat similar to that existing in the Bessemer business has also been manifest in the merchant iron trade. There have been large additions to the capacities of the mills, and mills that were idle for a number of years have been put in operation. The result is a production somewhat in excess of the demands of the country. When the strike in the West took place there was a tendency at that time to lower prices. This strike made idle mills equal to a production of about 2000 tons of finished iron a day for a space of nearly four months, or from the 1st of June to the 21st of September. As the result, the price of iron was fairly maintained at the rates ruling previous to the strike, but immediately upon the resumption of work, or shortly after, prices began to weaken. Consumers of iron were generally of the opinion that there was an overproduction, or at least would be in a very short time, and held off their orders, believing that the mills would be obliged to reduce prices in order to get work.

As to the future, while we have no doubt that prices will rule low, as compared with those that prevailed during the boom, we cannot see anything in the condition that is an occasion of any alarm, and we believe that in the readjustment that must come in the prices of materials and wages the iron trade will adapt itself to the circumstances, and that for a time at least there will be no fears of a repetition of the panic of 1873. The general condition of the country is decidedly against any trouble. Money is comparatively easy for legitimate purposes, and can be secured at low rates of interest. The crops for the past year were very good, and the railroads are in many cases showing decidedly favorable balance-sheets. While the railroads have been holding off for a short time from making purchases, it is evident that they will not do so much longer. Already one company has placed a large order for locomotives for delivery next year, and we hear of bids being asked for large numbers of freight cars. The stock of the Western iron mills was thoroughly depleted during the strike, and it will take them some time to stock up for the spring trade. This, taken in connection with the stop for the holidays for stock-taking and the slack running that always comes with the holidays, will not enable them to work up to their capacity for a few weeks at that time. In these mills there will be little occasion for repairs, as repairs were very well taken care of during the strike. On the whole, then, while we anticipate low prices, we do not anticipate disaster, and we believe that the mills will be fairly well occupied for some time into next year.

Our Steel Industry.

As noticed in previous issues, there are at the present time three new Bessemer steel works projected or in course of construction, one in Illinois and two in Pennsylvania, for the manufacture of steel adapted to other purposes than rails. The significance of this move, at a time when the majority of the Bessemer works in the country are panic-stricken and about to shut down on further output in view of the sudden reduction of the railroad demand, can hardly fail to attract attention. The fact that, even under the present depression of the industry, capital should be confident of the possibility of widening the market for pneumatic steel by its adaptation to novel purposes, would seem to confirm the often expressed opinion that the range of usefulness of the Bessemer product is by no means limited to supplying the rail market. It is certainly remarkable that more earnest efforts have not been made before this to extend the uses of Bessemer and open-hearth steel. Particularly noticeable is the fact that thus far so little attention has been given here to the manufacture of structural steel and the rolling of construction shapes. The complete success which followed the experiments made in that direction at Creusot and Terrenoire, in France, was quickly appreciated by both England and Germany, and these countries now monopolize this class of manufacture. It was undoubtedly unfortunate that the Bessemer product has so far been exclusively devoted to rail manufacture as it has. Constructors who had experience with the material in that form only were not imbued with much confidence in its adaptability to structural purposes. Nevertheless, there can be no question that both Bessemer and open-hearth steel could be readily and cheaply made formidable competitors of iron in all kinds of bridge, naval and architectural construction. Thus far almost nothing of the kind has been attempted here, but that there is a large field in this direction open to our steel-makers is unquestionable. Of course, it will require both time and thought in order to bring about such perfection of form, distribution of material and reduction in the weight per yard of the structural shapes as shall enable the steel mill to successfully compete with the iron-rolling mill; but that this can be successfully done has been practically demonstrated on a large scale abroad, and in isolated cases and experiments here.

Another branch of steel manufacture, namely, steel for ordnance, has thus far received hardly any general attention at all, and yet with our ores and our improved methods of manufacture we ought to command almost any market in the world for this class of product. It is sincerely to be hoped that the near future will see American steel manufacture emancipated from its dependence upon a single form of consumption, and that the vast superiority in plant and mechanical appliances, together with the steady progress in our knowledge of the proper treatment of the material for different conditions of service, will be taken advantage of for such a widening of the sphere of its adaptability as will at least considerably lengthen the periods of recurring inanition in our steel trade, if it cannot do away with them altogether.

The Tariff Commission and its Work.

From the time of its appointment it has been the correct thing in many quarters to attack and disparage the Tariff Commission. All sorts of charges have been made against it, and its conclusions have been condemned in advance, without any knowledge as to what those conclusions would be. It has been charged that the Commission was packed in certain interests; that certain other interests could not have a fair hearing before the Commission, and therefore they have refused to appear before it and state their views and wishes. It has been asserted that the Commission was not competent to consider the questions submitted to it, and that, if it was, the Ways and Means Committee was more competent, and it was its duty to investigate those subjects. The Commission has been held up to the public as a junketing body that was having a splendid time, drinking wine and riding over the country at the expense of the Government and doing no work, and as the time for making its report approaches, certain parties are endeavoring to create a feeling against the report in advance by making certain representations as to its scope and recommendations, without the least knowledge as to what these are.

We have carefully watched the Commission in its work, and while we do not pretend to have any knowledge as to what its recommendations will be, its course has convinced us of one thing—that it has been a very much maligned body, and that its report, when published, will be a surprise to many of its traducers, and a sufficient answer to the unjust and false statements made against it. As to the diligence with which the Commission has undertaken and attempted to perform the work assigned it there can be no doubt. Since its organization there have been few, if any, working days that have not been devoted to the investigation of these subjects. No one who has expressed a desire to be heard before it has been refused a hearing, and all letters and communications addressed to it have received respectful answer and consideration. The information collected by it has not only been very voluminous, but very valuable, and will be found to be so when its report is published. We further believe its recommendations will meet the approval of a large majority of the people of the country, with possibly the exception on the one hand of the radical free traders, and on the other of the radical protectionists; the moderate men of all parties will be satisfied. We believe it will be found that the Commission will make very general reductions all through the articles specially enumerated, and that the bill they will recommend will contain provisions which, while they may not entirely prevent the importation of goods under the "not otherwise provided" clauses at a less rate of duty than the articles out of which they are made, will make such importations more difficult, and in many cases more expensive, than to import them at the specific rate.

Now, if this is to be the character of the report of the Commission, we can see no reason why the present Congress at its session this winter should not put an end to the uncertainty that discussion of the tariff brings, and adopt either the report of the Commission or the report with some modifications. Even protectionists have acknowledged that there was need of a revision of the present tariff, and if others in Congress are earnest in their desire to have the tariff revised in such a way that it will not injure our industries, they certainly should take this report and put an end at once to this injurious discussion.

The Alleged Coal Strike at Pittsburgh.

The attempted strike of the coal miners in the railroad pits of Western Pennsylvania has turned out a perfect farce. The pits were to be idle on Monday, the 20th, unless the operators conceded the advance demanded—from 3½ to 4 cents a bushel for digging. This was represented to be the unanimous action of the convention that met in Pittsburgh the week before. On the day the strike was to have taken place a few pits only were idle. The officers of the Miners' Union used their utmost endeavors to bring out other pits, but succeeded in very few instances. Those that stopped work remained idle only for a day or two. At the close of last week the officers of the union confessed that they were beaten, although in their official column in the *Labor Tribune*, which is published on Wednesday, they stated that last accounts from the various sections of the railroad indicated that the "Panhandle miners will be standing firmly for the 4 cents by the end of the week." The operators never admitted that there was a strike in existence, though the leaders of the miners claim that there was. The miners held mass meetings and appointed executive committees, but the men would not come out, and on Saturday of last week, instead of the men being all out, they were all at work.

This strike, as we have already said in these columns, was a most unwise movement, and one that did not require the least foresight to predict would be an utter failure. There was not a single element in its favor, with, possibly, the exception that it was winter, and the demand for coal should be good. Everything else was against it. The iron industry, which is the largest consumer of coal, was in a depressed condition in all of its branches; steel rails lower in price; finished iron of all kinds, except nails, lower; and pig iron also lower; and to attempt, in the face of this, to advance the price of digging one-half cent, and, consequently, to advance the price of coal to these industries, was the sheerest folly. Though there is some talk about renewing the attempted strike in the near future, we imagine that the four-cent rate for digging is laid aside until the four-cent time comes.

In our issue of November 2, in an article treating of the imports of iron, we called attention to the large increase in the imports of castings for the time specified, the increase being specially noticeable. Through the kindness of Mr. Nimmo, the Chief of the Bureau of Statistics, we ascertain that in some cases, at least, a large proportion of these articles that are reported as castings is really taggers' iron. It will be remembered that one of the chief absurdities of the tariff law in regard to iron is the classing of taggers' iron with "all other castings of iron not otherwise provided for" at 30 per cent. ad valorem, the impression of Congress being, it would appear from the wording of the clause, that taggers' iron was castings, whereas taggers' iron is a very fine quality of sheet iron, 29 or 30 gauge and higher. Of course, the Bureau of Statistics is simply carrying out the wording of the tariff law in reporting this as castings. In the amount of castings reported as being entered at the port of New York during the month of June, amounting to 1,113,213 pounds, 779,269 pounds were taggers' iron. We understand that hereafter taggers' iron will not be reported as castings by the Bureau of Statistics, and we trust that, before the session of Congress that is about to meet is ended, taggers' iron will be classed properly with sheet iron and pay the sheet-iron duty.

The Decline in Copper in England.

Since our last editorial on copper, early in October, a fall in price has taken place in England of about £4. This decline has been chiefly brought about by heavier charters on the West Coast, the general statistical position on the other side being better than it was two months ago, and the deliveries fair. On September 30 the visible supply in England and France stood at 44,509 tons, the price of Chili bars then being £71, while on October 31 the supply in sight had been reduced to 42,910 tons, and the price had receded to £69. 5/. On October 31, 1881, the supply was 51,360 tons, Chili bars being worth £63. 5/; on October 31, 1880, it was 59,080 and the price £60. 15/; in 1879, 55,648 and £66; in 1878, 51,558 and £67. 10/; and in 1877, 42,253 and £65. 10/. In other words, the visible supply on October 31, 1882, was pretty much the same as in 1877 same date, but the price was about £4 higher. About half of this advance has since been lost. Charters on the West Coast during the first 10 months of this year were 34,100 tons, against 30,900 last year, and 35,800 in 1880. Before the war on the Pacific they were 43,900 in 1879, 41,300 in 1878, 38,600 in 1877, and 42,800 in 1876. The actual export from Chili had fallen last year to 37,500. In 1880 it was 42,990; in 1879, 49,390; in 1878, 46,770; in 1877, 45,400, and in 1876, 50,740. The heaviest export was in 1869, when it reached 54,867. A comparison of the figures we have given shows very closely the effect of recruiting for the war among the men employed in the copper mining regions of Chili. Gradually the army of occupation in Peru has been concentrated at a few important points, and its numbers reduced; and if peace should soon be made and all the Chilian troops withdrawn, there would be nothing in the way of Chili resuming her full productive capacity; possibly the decline in London may to some extent discount this eventuality. In regard to the supply of copper in Spain, it is evident, judging from the dividend which the Rio Tinto directors have just declared for the current fiscal year, that the output from the great Spanish mine remains steady and that the company are prosperous. In the same region, on the Portuguese frontier, another important mine has just passed into the hands of English capitalists, who will be likely to develop it until it may rival even the Rio Tinto.

The Prussian copper mines turned out last year 515,359 tons of ore, against 473,295 in 1880 and 336,947 in 1879, employing 11,946 miners. The smelting works there produced, in 1881, 14,623 tons of pure copper, and 1079 of matte, from 556,487 tons of ore. The import of copper ores into Prussia in 1881 was 34,694 tons, and of pyrites 26,303. These figures prove that copper production is gradually on the increase in Prussia. The inference to be drawn from all this is that outside of the United States the copper supply is again becoming quite ample, perhaps more than sufficient to counterbalance the increased uses of the metal on the other side. Although it is conceded as a fact that this year we shall again produce more copper than we did the previous one, there has evidently been no difficulty in placing our product, and nearly all of it at home; the steadiness of the price here and the non-accumulation of stocks prove this. Indeed there has not been a year that we remember in which the value of copper has been so exempt from fluctuation and speculation of any kind as has been the case this year. The leading producers have most of the time dealt directly with consumers, and studiously had in view steadiness in price, giving no chance to outsiders and speculators to dabble in the metal and cause artificial oscillations. This course of the market has suited the consumer best, but it is clear that the policy followed by the chief producers could not have been carried through if Western copper had competed with Lake to a greater extent on this coast than it has done. Western mattes that were formerly consigned to Eastern smelters have recently been exported to Europe at the rate of 600,000 pounds per month. While Europe, in anticipation of ampler supplies, especially from the West Coast, has thus receded to where she stood a year ago with Chili bars, we have kept steady despite greater production, a proof that the situation here must be intrinsically sound. Our uses of the metal have evidently risen to the level of the current output, for the stocks on hand at the centers of distribution are admitted to be moderate everywhere in this country. It has been and is a state of things equally satisfactory to the producer and consumer.

"Corners" are unpleasant to encounter in almost any shape, but perhaps the most formidable is the corner in money unwittingly caused by the absorption by the United States Treasury. Others are of a serious character, like the corner in grain in 1879–80, which held 300 vessels in New York harbor until they were compelled to sail away empty, to return no more. Mr. Macy, president of the Seaman's Savings Bank, testified before the Senate Committee on "corners" and "futures," lately sitting in this city, that in his opinion grain speculation is in most cases the worst kind of gambling, and contrary to good public morals.

Many other facts are elicited by the investigation of the committee. But, after all, the question remains, so far as there is any hope in legislation, "What are you going to do about it?" If it is actually true, as has been affirmed, that corners drive foreign buyers to seek new sources of supply in other parts of the world, so that America is losing her market for surplus products, the question deserves a very deliberate answer.

The Treasury Department and Wall Street.

It has become a question how far it is prudent for the Secretary of the Treasury to bolster the money market by stepping into Wall street. Are such measures as have been resorted to for some months past, however beneficial in their immediate effects, either desirable in themselves or safe as a precedent? If the purpose at one time is ostensibly to relieve the mercantile classes, may not artificial stringency be created at some other time in order to secure favorable terms for purchases by the Government, or to bring about some desired political effect? Besides, there is another standpoint outside of Wall street, from which it is worth while to take occasional observations, for low rates for money are not an unmixed and unqualified benefit. The large class of persons living on investments suffers severely when rates of interest decline; speculation is fostered, and all sorts of wild schemes brought into existence; extravagance and profligacy are given a loose rein. The most pernicious effect of interference with natural laws, however, may be seen in the shock upon the export trade arising therefrom, and the encouragement given at the same time to excessive importations. We venture to affirm that when the power of the Federal Treasury can directly or indirectly be subordinated to the purposes of speculation, or be arbitrarily applied to regulate "the street," no measure conceivible could be more hostile to the adjustment of the present unfavorable balance in our foreign trade. If prices decline, it is safe to assume that there is some substantial reason for it, and any temporary bolstering, however plausible the pretext, is only like attempting to dam an impetuous flood—the greater the obstruction, the more overwhelming the disaster that ensues.

Canadians manifest not a little concern since the adoption of the Free Canal Amendment in New York, but their magnificent system of canals proves to be a commercial and financial failure. The Montreal Board of Trade and the Montreal Harbor Commissioners alike present a petition to the Governor-General of the Dominion, asking that tolls in the Dominion be abolished and the St. Lawrence River be further improved. The petitioners represent that "transportation com-" panies in the United States are already " prepared to quote greatly reduced through " rates for the carriage of merchandise next " season from European ports to the West-" ern States, to the imminent peril of the " trade which Canadian common carriers are " endeavoring, amid many difficulties and " powerful opposition, to build up." The emergency which has arisen is considered very alarming. Our Northern neighbors feel, according to their own acknowledgment, that there is no alternative on their part but to yield to the necessity so clearly presented. The evidence, so far as it goes, clearly indicates the canal policy adopted by the people of this State at the recent election.

We cannot but regard it as a fair subject of complaint that merchants are to such an extent debarred from any participation in conferences at the Railroad Pool Commissioner's office, relative to the adjustment of rates of freights. The latter are arbitrarily fixed, of course, in the interest of the transportation companies, the other parties in interest—representing the public—not being in any way recognized, much less consulted. This course of procedure must have an end, and if our railroad corporations exercise an intelligent regard for the properties in their control, they will rectify the injustice of the Star Chamber methods of doing business.

The export trade to Mexico, which has been much embarrassed by high rates of freight, is in a measure relieved by putting on the route a line of sailing vessels. Shipments of agricultural implements, hardware, and especially railroad material, have, of late, been unusually large. Messrs. Grant and Trescott appear to be doing very little toward securing a treaty of reciprocity, and, as so large a proportion of Mexican revenues is derived from import duties, the prospects for an improvement in our commercial relations with that country are not just now very bright.

The International Metrical Commission, instituted in Paris by the various States using the metrical system, has recently brought its labors to a close. It has received the standard kilogram and standard meter hitherto deposited in the French Archives, and this fact has been communicated to the French Academy of Sciences. The resolutions of the Commission are to be ratified by the Metrical Conference, which is to meet once in every two years, and in the meantime the standard kilograms and meters intended for the individual States are to be prepared in conformity with the standards of the two units of weight and length lodged in the Archives of France. The new standards are equal to the existing ones within 1-100th of a milligram, so far as the kilogram is concerned, and within 1-1000th of a millimeter with respect to the meter.

Railroad Building.

The Chicago *Railway Age* reports that 1068 miles of road were completed in October, making 9143 miles in 10 months of 1882. About the close of October last year only 5763 miles had been reported for the year to date. But this is only what may be called the running count; it is impossible to get returns from quite all the railroads that are building or extending lines, and the addition at the close of the year of mileage not included in monthly or weekly reports swells the aggregate about 10 per cent. Hence it may be inferred that more miles of railroad had been completed from January 1 to November 1, 1882, than during the entire year 1881. In the months of November and December last year the completion of 2803 miles was announced, and after the close of the year about 820 miles not previously reported, but built at some time during the year, were discovered and added. If the construction during this and the next month equals that of the last two months of 1881, the running report will show an aggregate of about 12,000 miles built in 1882, and there will still remain some addition for roads previously overlooked.

The building in October was largely in the far North. Over a third of the whole was along the Canada border, 172 miles in Minnesota, 131 in Dakota and 62 in Montana—total 365 miles. West of the Mississippi, along the Southern line only 142 miles were built, including only 60 in Texas. In Colorado, 47 miles, and in other central States west of the Mississippi 94 miles, were built, making 141 miles. Adding only 33 miles for California and Oregon, we have 681 miles built in October west of the Mississippi River. In States south of the Ohio and Potomac and east of the Mississippi, only 112 miles were built; in the Northern States, east of the Ohio line, only 64½ miles, and in Northern States, between that line and the Mississippi, 211 miles, including 55 in Ohio, 33 in Michigan, 36 in Indiana, 49 in Illinois and 38 in Wisconsin. In all States east of the Mississippi only 387½ miles were built. Running a line along the Ohio and Mississippi Rivers from Lake Erie to the Gulf, we find only 176 miles of road built east of that line, and 892 miles west of it.

Apparently, the record of railroad building in 1882 will include over 12,000 miles of road, an addition of nearly one-eighth to the entire mileage of the country in a single year. It is hard to believe that so marvelous a concentration of capital and industry in one branch of business can prove healthful or profitable. The country did not seem ill-supplied with railway facilities at the close of 1880, and it had been increasing its mileage even then at a rate deemed by many almost alarming. But it then had only about 95,000 miles in operation, and by the close of this year will propably have 116,000, an increase of 22 per cent. in two years. There has been no increase at all corresponding to this in population, in wealth, in resources, in any branch of production, in foreign trade or in domestic trade. With nearly a quarter more railroads to move our products, we have an aggregate of products to be moved scarcely greater than we had at the close of the census year, with a much smaller demand for our products from abroad, and considerable evidence that the home market is not at present sufficient for the supply. Yet we have put into new railroads not far from $500,000,000 in actual cash within two years.

A Heavy Iron Suit.

A case involving a claim of $4,000,000 was argued in the Court of Appeals November 25. The action is entitled the New England Iron Company, appelant, agt. the Gilbert (now Metropolitan) Elevated Railway Company, respondent. The appeal is from the affirmance, by the General Term of the Superior Court of the city of New York, of a judgment dismissing the complaint. Action was brought by the plaintiff to recover damages for an alleged breach by the defendant of a contract made between the parties by which plaintiff was to construct 10 miles of the defendant's railway. The complaint alleges that the defendant refused to observe the covenants of the contract, and procured the portion of the road which the plaintiff contracted to build to be constructed by the New York Loan and Improvement Company; that by reason of the breach plaintiff has suffered damages, in preparing to go on with the work, to the extent of $5000, and has been deprived of prospective profits on the contract (based on the actual cost of the road as built), amounting to $4,000,000 in all. The defendant denies that the parties who executed the contract had any authority so to do, claims that the contract was incomplete and provisional, or conditional upon the doing of certain acts and the happening of certain events which were never done and never did happen, and alleges the insolvency and surrender of the corporate existence of the plaintiff before the commencement of the action, by reason of an assignment of its property to trustees for the benefit of its creditors, and its consequent inability to have performed the contract. The complaint was dismissed on the trial on the ground that plaintiff had disqualified itself by the assignment set up in the answer. This is the main question in the case, which is, nevertheless, very complicated.

The practicability of utilizing the various known coal deposits in Java continues to meet with attention at the hands of the Dutch Government, thus far, however, without substantial results. At present only one mine is in active operation, and its production during the year 1881 amounted to 5345 tons of block and 2331 tons of small coal. The quality of the coal is similar to that of fair Australian, and in working the mines no more than the usual precautions have to be taken against the explosions of fire-damp and other accidents of a similar nature.

LATEST LEGAL DECISIONS.

BANK'S CLAIM FOR MONEY LENT GUARDIAN.

A bank lent a guardian money to pay the taxes and other claims against his ward's estate, having received authority from the proper court to borrow the amount. The statute of Indiana, where this transaction occurred, required the guardian "to manage the estate for the best interests of his ward, and to pay all just debts." The Supreme Court of Indiana decided that the bank had a just claim against the estate of the ward in this case, Ray *vs.* McGinnis, and ordered that in the distribution of the funds of the estate the loan be paid; that under the requirement of the statute the guardian was justified in borrowing and using the money to pay the debts of the estate.

CONVERSION BY VENDER.

A sold cattle to B, who paid a part of the price on account, and requested A to keep the animals well for him for a week, for which he would also pay, when he would call for them, pay the amount due and the charges for keeping, and take them away. He did not come on the day appointed, and on the next day A sold the cattle to another person. A day or two later B came and demanded the animals, and, refusing to accept from A the amount he had paid him, brought an action against him for the conversion of his property. The Supreme Court of Michigan, in this case, Bowser *vs.* Birdsall, gave the purchaser judgment for what he had paid, but required him to pay the costs of the suit, as he had refused to receive the amount allowed him.

SNOW AND ICE ON SIDEWALK.

The city of Hartford was sued for damages for injuries suffered by A in falling on the ice on a sidewalk, and it paid a judgment recovered by him. Then it brought an action against the owners of the house where the sidewalk was, to recover from them the amount of that judgment. Snow and ice had been allowed for some days to accumulate on the sidewalk, making the walking dangerous to passers by. The Supreme Court of Errors of Connecticut gave judgment against the city in this case, City of Hartford *vs.* Talcott. Judge Pardee, in the opinion, said: "The State places on municipal corporations the burden of keeping the highways within their respective limits in a reasonably safe condition for public travel; and in cities and boroughs this duty is coextensive with the width of the street, including that portion used by foot passengers exclusively. As both the carriage and foot ways are for the convenience of the public, and not for the especial use and benefit of adjoining proprietors, under the general law, the money expended in maintaining, and in making compensation for injuries resulting from neglect to maintain, is to be paid by the public from taxes assessed equally on all property. The ownership of land upon a way does not carry with it the burden of an unequal contribution to either branch of these expenditures. So far as defects in it result wholly from the operations of nature, he at whose front they exist is without responsibility for them. Therefore, where ice has accumulated upon the sidewalk to a dangerous extent, it is the duty of the municipality to remove it or cover it within a reasonable time after its formation.

LIABILITY OF STOCKHOLDERS FOR DEBTS OF CORPORATION.

The stockholders of a corporation were sued for its debts to the extent of their unpaid assessments. The capital stock was $10,000,000, but it had been reduced to $500,000. The United States Circuit Court for the Northern District of Illinois, in this case, *in re* the State Insurance Company, decided that the stockholders were liable to the creditors whose debts had accrued before the reduction of the capital stock for the amount of their unpaid assessments upon the original stock, or for enough to pay the debts of the corporation. Judge Drummond also said: "It is urged that the stockholders stand in the position of sureties to pay the debts of the company. It is, perhaps, not material what term we apply to them. Whatever is legally due from them constitutes a fund for the payment of the debts of the company. Their liability is unloubtedly secondary—namely, on default of the assets of the company not being sufficient to liquidate the claims against it."

LIEN FOR LABOR AND MATERIALS FOR RAILROAD CONSTRUCTION.

A contractor had supplied lumber for the construction of the road-bed of a railroad between two interior points thereon, and failing to get the money for it, he filed a lien against the road-bed, the buildings, erections and improvements of the railroad between those points. The statute under which the lien was filed gave a lien for labor and materials supplied on the road-bed, &c., upon "such road." In this case, Knapp *vs.* St. Louis, Kansas City and Northern Railroad Company, the Supreme Court of Missouri gave judgment against the contractor, on the ground that under the statute the lien was not valid unless filed against the whole road, no authority being given therein for a lien against a section of a road only. Judge Hough, in the opinion, said: "It has several times been declared by this Court to be against public policy to permit detached portions of a railroad to be sold under an ordinary execution, or under a judgment enforcing a mechanic's lien.

ACTION ON CHECK AGAINST BANKER.

A building association settled its account with its banker, who retained the amount of one of its checks which he had refused to pay when it was presented. Then the holder demanded payment, and was refused. He brought an action against the banker, Saylor *vs.* Bushong, and the Supreme Court of Pennsylvania decided in his favor. Judge Trunkey, for the Court, said: "It may be regarded as settled that the holder of a check cannot maintain an action in his own name against the drawees, though they have sufficient funds of the drawer, if they refuse to accept it. A check may be revoked before presentment by the drawer's death, or by his order not to honor it; but if it is not revoked, it is the duty of the bank to pay it on demand. For breach of this duty the drawer has a right of action. Prior to acceptance, it is said, there is no priority between the holder and the bank, and therefore the holder cannot maintain an action. But if the bank, expressly or impliedly, promises the drawer to pay the check, the holder may sue if payment is refused. When a depositor settles his account with the bank and leaves the exact amount of an outstanding check expressly for its payment, and the bank tacitly retains the money and settles on that basis, it is liable to the holder on the implied acceptance. All parties to the check would naturally infer from such action that the bank retained the money for the use of the holder.

DISCHARGE OF BANKRUPT.

A bankrupt applied for his discharge, but his application was denied on the ground that it was not made within one year from the date of the adjudication in bankruptcy, as required by the act. Subsequently an amendment was passed which made the time for the application at any date after the expiration of 60 days from the adjudication and before the final disposition of the cause, and the bankrupt then made a second application for discharge. In this case, *in re* Brockway, Judge Wallace, in the United States Circuit Court for the Southern District of New York, again denied the application. He said: "The subsequent amendment of the Bankrupt act did not impair or effect the controlling force of the previous adjudication. Assuming what may well be controverted, that the amendment may be given such retroactive effect as to authorize an application for a discharge in a pending proceeding, although the year from the date of the adjudication of bankruptcy has expired, it certainly cannot operate retroactively to overthrow a prior judgment. A retrospective construction to a statute is never favored, neither will it be inferred that Congress intended to exercise a doubtful power. It is at least doubtful whether it (the act) would be within the legislative competency if intended to effect such a result.

MECHANIC'S LIEN AGAINST HUSBAND'S INTEREST IN WIFE'S LEASE FOR 999 YEARS.

A dye-house was built by A for B on land in the possession of C, B's wife, whose interest was an unexpired term of a lease for 999 years. A filed a lien against the house and land and brought an action for foreclosing it, Flannery *vs.* Rohrmeyer, but his suit was dismissed by the Supreme Court of Errors of Connecticut. Judge Loomis, in the opinion, said: "That the interest of C was a chattel real, which was personal property only, and that the husband has no interest in such property when the laws of the State give his wife a separate estate in her own property. If her interest in this property had been a fee in the land, the lien would be good against the husband's interest as tenant by courtesy, but she has not such an interest, and he has no right whatever in it."

CHANGE OF OWNERSHIP WITHOUT CHANGE OF SIGN.

A, a merchant, became embarrassed and was sued, and he at once assigned, in writing, all his stock of goods to his mother, who assumed the payment of certain of his debts. She took a new lease of the store in her own name and requested B to take charge of the business for her, A remaining as a clerk. New books were opened in her name, and a sign announcing the change of ownership was placed over the desk in the store, but the outside sign remained unchanged. Creditors of A, having obtained judgments against him, issued writs of execution, under which the sheriff seized and sold the goods in the store. There was evidence that he was warned that the goods were the property of the mother. She sued the sheriff for the value of the goods, McPherson *vs.* Kinnear, and the Supreme Court of Pennsylvania decided that the evidence of the change of ownership was sufficient; that the retention of the old sign and of A as a clerk and agent did not affect the title of the plaintiff.

CONSIGNMENTS, ADVANCES AND DIRECTIONS TO SELL.

Butter dealers at Nevada, Iowa, consigned butter to commission merchants doing business in Boston, and the consignors asked for and received advances on their shipments. The merchants sued for advances, interest and the charges for storage, and the consignors set up a counter-claim to recover the value of the butter, alleging that the plaintiffs did not sell it when they had ordered it to be sold, but held it until it became worthless. In this case, Butterfield *vs.* Stephens, the Supreme Court of Iowa reversed a judgment in favor of the consignors. The Chief-Justice (Seevers), in the opinion, said: "The rule is, where advances are made by a consignee or commission merchant, a consigner cannot direct a sale at his pleasure. In such a case the consignee, in the absence of an agreement, has the right to sell at such time as he sees proper to the extent of and in payment of his advances."

CHATTEL MORTGAGE ON STOCK OF GOODS.

D gave a chattel mortgage to C on a number of peddler's wagons and the horses in use with them, and "also all the stock, goods, wares and merchandise which may be added to or got for use in the business, or for which any exchange or trade shall be made of any of the aforesaid goods, wares, merchandise, chattels or property in the course of the said business." New purchases of goods were made by D, but before these reached him they were seized by a sheriff under an execution against him. The mortgagee sued the sheriff for the conversion of the goods, as he claimed a lien upon them as goods "added to or got for use in the business," and was successful. The judgment was carried to the Supreme Court of Michigan, which reversed it. Judge Cooley, in the opinion, said: "The rule in this State is, that a mortgage may be made to cover after-acquired property. But we have never ruled that a chattel mortgage made to cover the ordinary additions to a stock of goods will cover property purchased, but never added to the stock. To subject any property to the lien of a chattel mortgage it must come within its descriptive words."

SALE ON FRAUDULENT REPRESENTATIONS.

A wine company sold 100 cases of wine to B, representing to him that it was of a certain quality, and that there was a good and constant demand for it in Colorado and New Mexico. B paid the price by an acceptance of the company's draft. Before the draft was due, B gave the company notice that he rescinded the contract on the ground that the representations as to the quality of and demand for the wine were false, and he advised the company, in the same letter, that he held the wine subject to the order of the vender. An action was brought on the acceptance—American Wine Company *vs.* Brasher—in the United States Circuit Court for the District of Colorado, and the purchaser defended on the grounds stated. On the trial it appeared that B had sold 20 cases of the wine, and the company argued that, as he could not put it in the same situation as it was in before the delivery of the wine, by reason of the sale of part of it, he had not the right to rescind the contract. A verdict was given for B, and the point was reserved for argument that the tender made was not sufficient, as all of the goods were not offered back. Judge McCrary, in giving judgment for the defendant, said: "Where the contract has been induced by fraud, it is not necessary that the injured party seeking to rescind the contract should absolutely tender what he has received on the contract. In this case if B had sold all, or nearly all, of the wine he could not rescind; but having sold but a small part of it, the sale being in contemplation of the vender and purchaser when they made the contract, B was not precluded from rescinding. That he did not advise the company, when he gave notice of rescission and offered to return the wine, that he had sold a part of the goods, will not control his right, as he is able to put it in substantially the same position as it was in before the contract was made."

PAYMENT TO FOREMAN OF FACTORY WHO WAS GENERAL SUPERINTENDENT.

Fifty jack-screws were cast at a foundry in the absence of the proprietor by the foreman, on an order taken by him. Before the screws had been cast and delivered, the foreman had borrowed a sum of money for the use of the foundry from C., to whom, after the screws had been delivered, he assigned the bill for them, and it was paid. The proprietors of the foundry sued for the screws, Hoskins *vs.* Swain, and the defendant pleaded that he had paid the claim. The power of the foreman to borrow the money and assign the account was the question in dispute. The judgment was in favor of the defendant, and the plaintiffs appealed. The Supreme Court of California affirmed the judgment. Judge McKee, in the opinion, said: "The foreman had been accustomed, in the management of the business, to buy material for the foundry, employ workmen, sell the goods, collect the accounts, and receipt for moneys received, and disburse them in payment of bills, &c., against the foundry, and this course of dealing had been sanctioned by the plaintiff. We think the foreman had authority, ostensibly, as regards the public, to assign the accounts to secure the money he had borrowed; for in authorizing him to act as general superintendent and manager of the foundry the plaintiff has intrusted him with the conduct of the business therein, and empowered him to do everything necessary or proper and usual in the ordinary course of the business for effecting the purpose of his agency. Payment to him of a debt due the foundry would therefore be binding on the plaintiff; and if he by assignment empowered another to collect the debt the payment of it in good faith would discharge the debtors.

INSOLVENT DEBTOR.—NON-RESIDENT CREDITOR.

A debt attends the person of the creditor, and unless he is within the jurisdiction of a court, no determination thereof can affect his rights. Therefore, a discharge by a State court of a debtor in insolvency proceedings will not bar the claim of a non-resident debtor who has taken no part in nor submitted himself in any way to the jurisdiction of the insolvency tribunal. Bedell *vs.* Scruton, Supreme Court of Vermont.

Boiler Tests.

It is a popular error to suppose that the evaporative duty of a boiler is measured by simply weighing the water pumped in and the coal fired, and dividing the first by the second, taking care that the fire, water level, &c., are the same at the beginning and end of the test. The result obtained by this proceeding would undoubtedly be accurate in all respects if all the water were completely evaporated into steam, but that this is not the case is undoubtedly well known to all of our readers. We know that when a boiler foams or primes, or even when in a normal condition, a certain percentage of water is carried over into the steam pipes together with the steam, and, unless we have some suitable means of superheating, the steam furnished to the engine will be what is known as wet steam. It is perfectly clear, then, that when a certain quantity of water disappears from the boiler the whole quantity is not transformed into steam. Suppose, for example, that with every 9 pounds of water completely evaporated into steam, 1 pound is carried over mechanically in the shape of suspended spray, the apparent duty of the boiler would then be 10 pounds of water per pound of coal, instead of 9 pounds, and the engine would, in all probability, be charged with 10 per cent. too much waste, an amount for which it is in no way responsible. In actual practice the loss from suspended water is often much greater than the above proportion, and it will therefore be seen that with such a test the greater the loss the greater will be the apparent duty of the boiler.

In order to arrive at correct conclusions and to get reliable figures as to the evaporative duty of the boiler, we must conduct what are known as calorimeter tests, and the method of proceeding in this connection has been dwelt upon several times in former issues. The subject, however, is of such importance that a brief outline may well bear repetition. The steam is drawn from a supply pipe into a known weight of water of a given temperature until the water has risen to a certain other temperature. From the specific heat of steam and water, it is known

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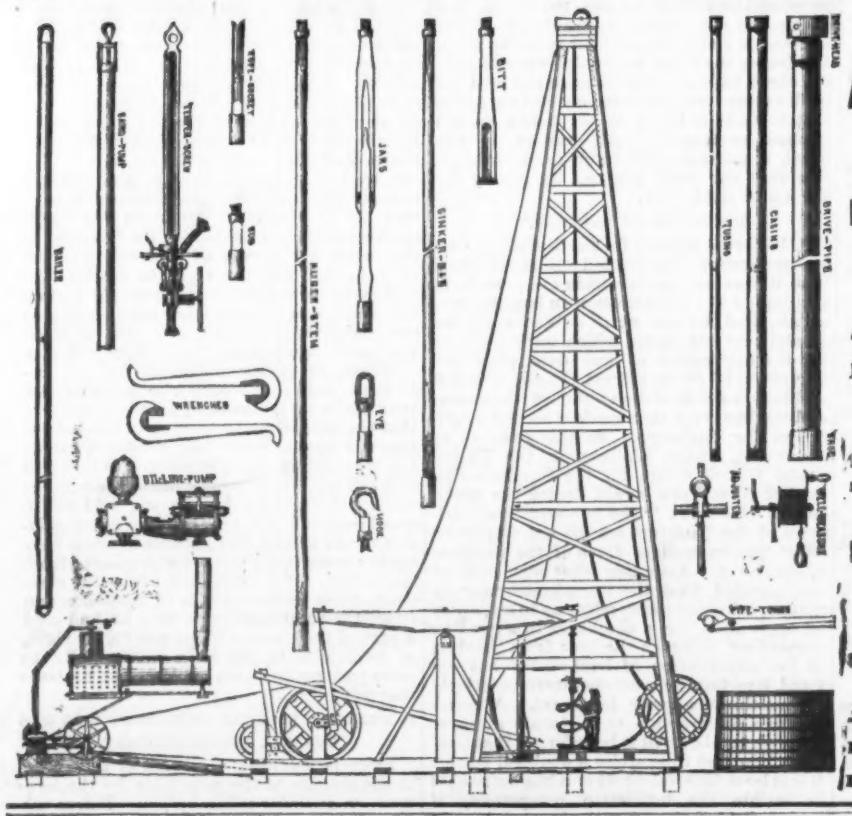

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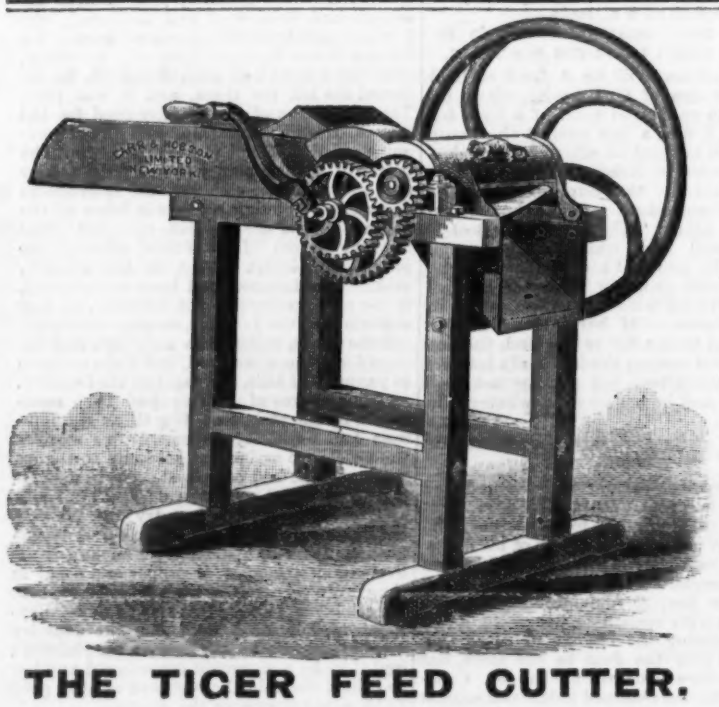

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The Knives and Rollers are securely covered, guarding against danger from cutting the operator's hands, in the working parts of the machine.

The first three sizes are made for hand power only, while the remaining ones may be used by either power or hand.

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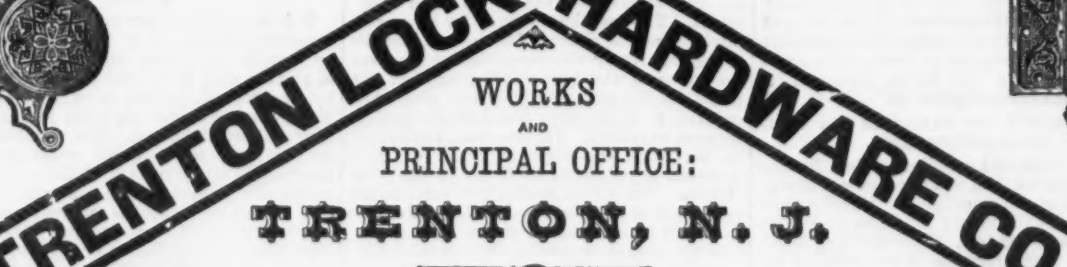

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that the weight of the water should have been increased by a certain definite amount from the steam condensed, so as to correspond to the increase of temperature. Any excess of increased weight over the amount thus calculated is due to water mechanically introduced with the steam, and must be subtracted from the gross amount fed to the boilers. In this way only will the true evaporation per pound of coal be obtained, and a correct understanding of the principles involved will save much misapprehension and pecuniary loss.

WASHINGTON LETTER.

(*From Our Own Correspondent.*)

WASHINGTON, D. C., November 28, 1882.

THE PRESIDENT'S MESSAGE.

The annual message of the President to Congress will be laid before the Cabinet on Friday. The Executive Reports are also ready, and as usual are confined to the routine matters of the departments, giving a retrospect of the year's work, and submitting some unimportant recommendations. The report of the Secretary of the Treasury, as already stated, recommends provisions for liquidation of the National debt, and to meet such changes as may be made by Congress in the revenues. The Commissioner of Internal Revenue in his report presents a scheme of reduction which would bring the revenues from this source down to $100,000,000. He thinks that this amount of scaling is as much as could be accomplished at one time with safety to the mercantile and financial interests of the people and the Government. The President thinks that it would not be expedient to entirely abolish the Internal Revenue system, but that it should be reduced by degrees. He will recommend the adoption of a measure materially the same as that favorably acted upon by the committee of the two houses of Congress last session, and referred to recently in this correspondence. The President's plan is to wipe out all internal taxes except upon spirits, malt liquors, tobacco and cigars, and the special tax upon manufacturers and dealers in such articles. He also proposes a slight reduction in the tax on spirits and tobacco.

THE COMMITTEE ON WAYS AND MEANS.

At a recent meeting of the Committee on Ways and Means, at which Judge Kelley, Chairman; and Kasson, of Iowa; Hubbell, of Michigan; Ewett, of Pennsylvania, and Speer, of Georgia, were present, the report of the Tariff Commission not being ready for consideration, it was decided to adjourn until December 5. The president of the Commission advised the committee that the different sub-committees were industriously at work, and were confident that the report would be ready for transmission by the time of the meeting of Congress. Accordingly, the committee adjourned to meet the day following the assembling of Congress. Whatever may be the final disposition of this report, the committee are disposed to take it up for consideration at the very earliest moment.

THE NATURE OF THE COMMISSION'S REPORT.

Judging from conversations of members of the Commission, the general features of their report will favor a protective tariff. The greatest changes will be in the duties on iron and sugar. These changes will be more in the adaptation of the methods of rating and the rate itself to the changed condition of things to-day, as compared with about 20 years ago, when the bill was passed, than in any disposition to come down to a revenue basis merely. A reduction of the duty on steel rails and possibly several grades of iron will be recommended. In other respects the amount of duty will not be materially disturbed. Some important changes will be urged with reference to the method of levying the duties, the object being to simplify and to remove, if possible, the causes of the ambiquities and complications of the present tariff, and out of which spring the interminable controversies between importers and the Treasury Department. Members of the Committee on Ways and Means speak of the report from what they know of it as promising much useful information and many valuable suggestions.

THE METROPOLITAN INDUSTRIAL LEAGUE.

Although the general testimony taken by the Tariff Commission will have its value, the statement reported and submitted by the Metropolitan Industrial League is of special interest and importance, as it embraces a digested view of the wants of the industries named, and in addition furnishes an amount of data which is peculiarly opportune at this time. As the tariff question will come up for discussion in the immediate future, the correspondent of *The Iron Age* has made the following digest for its readers.

PRELIMINARY STATEMENT.

In submitting the report, Mr. Hill, of the Department of State, who compiled and collated the material, says very truly: "For the first time in the history of our country, an incorporated commercial and industrial association, embracing all branches of industry, has undertaken the work of preparing and presenting for consideration a revision of our tariff laws and schedules of rates."

A COMPARISON OF TARIFFS.

The report says that the present tariff has been much abused, but is far from being the worst extant; that within the last five years he had collated the tariff of every country and had analyzed each and compared the same with our own, and finds that there is far more ambiquity in almost every other tariff than in our own; that even the short British tariff is susceptible of misunderstanding, and the litigations thereupon are not infrequent.

EFFECT OF PROTECTION.

We have advanced to the head of all the nations of the world in wealth in the last decade, under our protective policy, and, although imperfect in many points of detail, our tariff has nevertheless proven to be based upon a wise system that conduces to the prosperity of the agriculturist as well as the manufacturer, the miner as well as the banker, the tradesman as well as the shipper.

THE WORLD NOT MOVING TOWARD FREE TRADE.

It has been asserted that the world is moving toward free trade. It is the reverse. England stands alone; not even will her colonies follow her. Look at the present standing of all nations. It will be seen that the principal nations declare at present—For protection: Argentine Republic, Austria, Hungary, Belgium, Chili, China, Canada, Denmark, France, Germany, Guatemala, Japan, Mexico, Norway, Portugal, Russia, Spain, Sweden, Switzerland, United States, Turkey, Greece, and even the Australian Colonies. For so-called free trade: Great Britain and the Netherlands. The tariff of the Netherlands ranges from 5 to 20 per cent. ad valorem and slightly specific, but she is purely a commission nation.

THE RELATION OF PARTIES.

The relative strength of parties in the Forty-eighth Congress, according to sections, from revised lists made up in political circles here, is as follows:

Sections.	Democrats.	Republicans.	Total.
New England	6	20	26
Middle States	37	33	70
Western States	60	56	116
Pacific States	7	1	8
Southern States	87	18	105
Total	197	128	325

The West and South, therefore, where the free-trade sentiment most exists, have 147 Democrats to 74 Republicans.

THE SPEAKERSHIP.

In the contest for the Speakership, the race having practically narrowed down to Carlisle and Randall, it will be seen by the figures above that the former has the best chance of election. On the tariff issue there is now no choice between the two. The recent interview with Randall shows that he is making a bid for votes by sacrificing the semblance of favoring protection which he once wore. Carlisle will get the solid South (87 votes), without a doubt, to start with, leaving the remaining 12 required to give him the caucus nomination to be picked up among the Western Democrats, numbering 60.

It would be supposed from the amount of talk among Democratic politicians who are beginning to congregate here, that the election of a Speaker was to take place upon the reassembling of Congress. It is hinted among those who are generally well informed that an effort will be made to force an extra session, so as to get at the organization of the House immediately. In reply to the suggestion of such a possibility, it was remarked in administration circles that the President would hesitate long before calling Congress together; that the appropriations would not be exhausted until June 30, the end of the fiscal year, and an effort would be made to bridge over until December. In view of the bitterness which will be inevitable in a contest between Carlisle and Randall for Speaker, the friends of ex-Senator and now Representative-elect Eaton, of Connecticut, are agitating his name. He is put forward as a compromise candidate on the tariff. It is claimed for him that he was the projector of the Tariff Commission scheme as a means of settling that important question.

Underground Conduits for Electric Wires.—A large number of prominent electricians, merchants and those engaged in telegraphy, telephone matters and electric lighting, together with representatives of insurance companies, met in Philadelphia on November 21, for the purpose of witnessing a demonstration of the American Sectional Electric Underground Company's method of running wires beneath the surface. The conduit or main used by the company is composed of overlapping iron plates and has manholes at convenient distances, so as to render the interior readily accessible. Suitable openings are also supplied through which to make connection with street lamps or houses. The wires are conducted through metallic tubes packed with rubber, the tubes being supplied with screw threads, so as to permit the union of different sections. Within the main are uprights with short arms projecting just long enough to hold a tube about ¼ inch in diameter, thus forming racks on which to lay the line of tubes. The principal main is made large enough to carry a large number of wires and leave enough room for a man to pass through when repairs become necessary or a new line is to be laid. The individual wires, as already stated, are properly protected against external influences and the method is expected to give very good results. In addition to the conduit proper, a chamber 6 by 10 inches and holding about 250 wires is made under each gutter, and by this system the company claims that it can convey the greatest number of wires in the smallest space consistent with their proper functions.

A Faure Accumulator Company.—Articles of incorporation were recently filed in the New York County Clerk's Office of the Faure Electric Storage and Light Company, with a capital stock of $2,000,000, divided into 20,000 shares of $100 each. The object of the company is to manufacture, purchase and sell all kinds of electrical apparatus and machinery, to acquire patents relating in any way to electricity or to machines connected with electricity for lighting, storage and other purposes, and especially to acquire and work all patents and inventions of Camille A. Faure and Charles G. Perkins. Several months since Mr. William B. Whiting, of this city, and Mr. William Lachlan, an English engineer, arrived in this city from England, bringing with them a number of the Faure accumulators, with the view of making experiments and establishing branches throughout this country of "La Lumière et La Force," which company at that time had exclusive control of all the inventions of Mr. Faure. The purchase then of the exclusive right to use Faure's inventions in the United States led to the formation of the company here considered. It is understood that the storage batteries are to be used principally for lighting private houses, theatres or the streets. The company, however, feel fully competent to provide the power necessary to run street railroad cars and smaller appliances, and, considering the many advantages offered by the use of the accumulators, it is but reasonable to expect that the public will soon recognize their superiority over many other forms of applying electricity.

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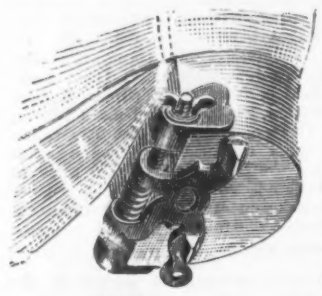

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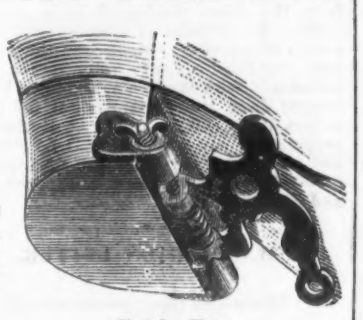

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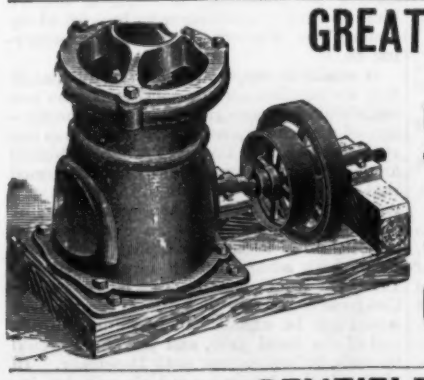

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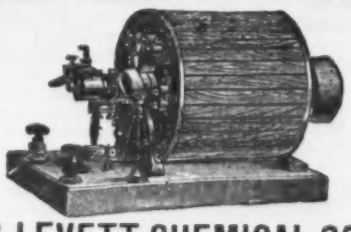

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Alumina	3.27	Titanic Acid	—
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Lime	1.65	Soda	—
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Metallic Iron ..... 53.31 %.
Metallic Manganese ..... .24.
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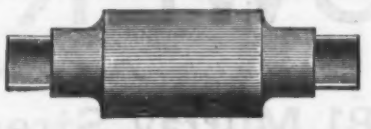

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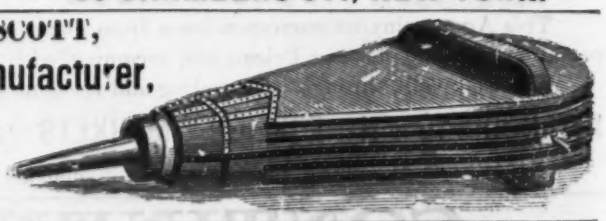

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Paxton Furnaces, Pa.
Spearman iron Co., Pa.
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Milton Coal and Iron Co., Ohio
Winona Furnace Co., Ohio.
Moss & Marshall, Ohio.
H. Campbell & Sons Ohio
Hocking Valley Iron Co., Ohio
Cleveland Rolling Mill Co., Ohio.
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Bloss Furnace Co., Ala.

Water Wheel Power.

Speaking strictly, says the *American Miller*, the measurement of the actual discharge of a water-wheel is not a troublesome thing when it can be set up in the proper shape for the express purpose of having the discharge measured, but when the wheel is in place, either alone or by the side of others, in actual condition of working, this measurement becomes a very difficult matter, and, in fact, quite impracticable; so, too, the attachment of a dynamometer to the wheel-shaft, or to some similar convenient part, involves so much trouble and so important an uncertainty in the interpretation of its results that in practice it is never done.

The manufacturer is therefore left in the dark, except as he may be able to judge of his work by what he may have seen, or by what others tell him, of the measurement of the steam-power required to do similar, or perhaps the same, work, or, to be more exact, what appears to be the same work, for appearances are at times extremely deceitful in such things. A wheel is called a steady running wheel, an unequaled developer of power, and sometimes by even more inexact names, when in reality the only thing known is that in doing such and such items of work, which may or may not be the same as those done elsewhere, a wheel may be wasting from leakage an important part of what is supposed to pass effectively through it, or there may be some unsuspected loss due to uneven wear below the limit of convenient examination and repair. In fact, a wide variety of causes renders it a very troublesome job to measure, and still more to estimate, the real effective power of a wheel when taken in the ordinary condition of practice, as shown in the average water-power mill.

The only consideration that can be offered in explanation at so much apparent neglect is the fact that the water-power is cheap, that it pays better to let the wheel alone as long as it does the work, rather than to lose the time and spend the money to examine it and to overhaul it if it were found in bad order. This may be a good plea for a water-wheel, but it would be rejected if offered to a mill owner as sufficient reason for failing or refusing to examine any other part of his business, so that he might know absolutely concerning it that it was right and in perfect order. The worst feature, probably, about this willingness to go it blind is the serious chance—which in scores of cases has proved a certainty—that the wheel, or the department of the business, will be let run so long that when absolute failure or slackening of speed does occur, it is at the instant when every nerve of the establishment is strained to the utmost, and must be, to meet engagements, and when the inevitable loss due to the needful repair may become tenfold, or even more, what it need be if the time for examination and repair had been deliberately chosen. One danger, too, in this regard is that time may be really lost in hunting for the trouble or the slowing of the speed in the wrong place, so long as the general principle is held that while the wheel will run it is in itself all right.

These general considerations of course have nothing to do with the size of the wheel, being as true for one as for another, though the larger the wheel the greater the loss when it is really out of adjustment. So long, however, as some very profitable lines of business depend upon small or medium-sized wheels, so long even the smallest wheels should be kept sharply up to their work. The real cost to a mill of a badly-kept or worn-out wheel may very easily become that due to a loss of one or two hours' run when water is low, and the wheel must be fed from that which has been stored up during the night while the mill-wheel is idle, and the obtaining of this one or two hours' run, or its loss, may easily make the difference for weeks at a time between a profit and loss to the whole establishment. A reduction of output of 20 per cent., or even of 10, is apt to be a burden that no mill can stand when charged against its current business. These questions do not relate directly, it is true, to the quantity of power developed by a wheel, or the other query suggested as to whether this quantity is really known, but the whole is summed up in the general term, the "efficiency" of the wheel, and thus one quite includes the other.

It may be said that no manufacturer would expect to run his mill so close up to the margin of his water-power as to be stranded or embarrassed by the failure of his pond at 5 p. m., when he needs to run until 6 o'clock, and that he would be sure to provide steam power to run by long before storage areas had been so completely drained. While this may be true with many men, perhaps with most, it is still true that the suggestion is worth making to one man or two out of 10, whose wheels are in the very condition described, that of wasting during the day the water that would have run them during the last one or two hours. Those manufacturers are fortunate, and the water-wheel builders are, too, who have the opportunity to measure the power of their wheels by the ready transfer of their load to a good steam engine, to which have been fitted the simple fixtures for determining the load upon the engine at any required moment. These measurements of water-wheel loads have caused some surprises as genuine and complete as have ever fallen to any builder of machinery, for their accuracy cannot be questioned, and they have been known to show that the wheels were rated and were supposed to be running to a horse-power far above that which the engine showed the load to be when transferred to it.

All these considerations show, or ought to show, to a thinking man that comparisons should be diligently made of the work done by a water-wheel, not only as compared with another wheel which is believed to be doing the same work, but, what is much more important, as compared with the absolute standard for that particular wheel in its own particular place. These things are not always easy to do, but the more difficult a task of this sort becomes, the more certain it is apt to be that it ought to be undertaken at any probable cost.

It is undoubtedly known to our readers that M. Clémandot recently discovered a process of tempering steel by compression, and that steel thus tempered acquired the power of becoming magnetic which characterizes ordinary steel. Later experiments have shown that this coercitive force is permanent, and does not disappear even after reheating or forging the steel. Ordinary steel loses this force if it is reheated and softened, while, according to M. Clémandot, the magnetic power of the compressed steel is indelible, whatever its subsequent manipulation. In order to illustrate this he took several plates of the core of a magneto-electric machine, broke and forged them into a bar which he compressed and cut into plates, then magnetized them, and thus restored the magnetic power which they had at the beginning. This power remained constant although the plates were afterward heated and reforged, and it cannot be doubted that this property will be found of great value for electro-magnetic appliances, which are apt to lose their magnetic properties.

Carbonization of Wood in Retorts.

Almost a year ago we submitted in our columns an account of some data concerning the operation of carbonizing wood in retorts as practiced at Port Leyden Furnace, New York. This account was furnished by Mr. J. A. Mathieu, of Detroit, Mich., in a paper read before the United States Association of Charcoal Ironworkers, and a few additional facts concerning the carbonization of wood in closed vessels, given by the same gentleman at the last annual meeting of the association, may not be without interest.

Mr. Mathieu stated that some 21 years ago he employed fixed vertical cylindrical retorts of half-cord capacity, heated from beneath by spiral flues passing around the sides of the cylinders. It was found that these closed vessels, after a short operation of about one month, were destroyed by the alternate contraction and expansion. The coal resulting from these operations was very light, weighing only 16 pounds to the bushel. Some time later Mr. Mathieu adopted vertical cylindrical retorts of an equal capacity, which were removed from the oven or heating chamber by an overhead crane. The bottom part of the cylinder was protected from direct action of the heat by a fire-brick arch, and the products of combustion through flues at the lower part of the heating chamber heated the cylinder externally by radiation from the walls. These retorts were protected by a wash consisting of clay. The carbonizing was very rapid, but with great care the retorts could be kept in operation for more than six months. Mr. Mathieu next tried horizontal retorts made of cast iron of different sizes and partially protected by fire-brick. He found that very often during the first part of the operation the water exuding from the wood and coming in contact with the heated surface would cause the cast iron to crack. After four or five months' operation, those that had not cracked were so badly warped as to be unfit for use. Another strong objection to this style of setting was that the wood in the center of retort was too much carbonized, while one-third of wood, at both ends of retort, was not charred. After this, cylindrical retorts of wrought iron were adopted, being placed horizontally, both fixed and later movable; also, the same form placed in an inclined position. The destruction of the iron of inclined retorts was not so rapid as of those formerly employed, but the shape presented serious obstacles to the proper protection of the surface of the iron, by fire-brick, from the direct action of the heat. Mr. Mathieu further experimented with retorts, made of refractory material, of different shapes placed in different positions; but all of these broke too rapidly by unequal expansion, which limited their use to those of small size only, and required too much labor. In order to have retorts of large capacity, he endeavored to have an arch of fire-brick, on which the retort should rest, and which should protect the surface of the retort to be heated. He also placed them in an inclined position, to facilitate filling with wood and emptying the coal, and also to produce a more thorough and regular carbonization of the contents. By being placed in pairs, both retorts are heated by the same heating chamber and fire-place, giving a more regular operation. Retorts of this form, after having been in operation for 18 months, were examined by Mr. Birkinbine, and found to be in perfect condition. An experiment that was made gave a yield of 75 bushels of charcoal to the cord of wood. The record of the yield of the retorts at Port Leyden—namely, 66 bushels to the cord—was made from small wood, and with medium-sized wood an average yield of 70 bushels to the cord can be obtained.

By placing the retorts in benches of 16, the gas resulting from the distillation is amply sufficient to operate them without using any solid fuel in the fire-place. The tar and sawdust can be used to make artificial fuel, which can be employed to start the retorts when they have been stopped. The time necessary to empty the retorts is only five minutes, and the same amount of time is required to fill them again with wood. Owing to this rapidity of manipulation, the retorts do not have time to cool, and all danger of fracture, due to expansion and contraction, is thus avoided. The coal in the cooling tank can be transported, directly after weighing, to the top of the furnace and charged while hot, or can be cooled for 10 or 12 hours, so as to render it suitable for storing. No water is used in extinguishing the coal, as the cooling tanks are made air-tight by luting with clay. It is a noteworthy fact that the space occupied by a plant of this description amounts to only one-tenth of that occupied by kilns to produce the same number of bushels of coal. In addition to this advantage, it is to be considered that the coal made in this way is more dense that that made in kilns, and will carry 16 per cent. more blast. Mr. Mathieu states, moreover, that it is absolutely dry and free from dirt, and will carry 25 per cent. more burden, increasing the yield of iron from 15 to 20 per cent. without extra expense of labor, and requiring a smaller quantity of lime.

By employing the tar resulting from the distillation of wood, together with the braize that had accumulated at Port Leyden for a number of years, an excellent fuel was made at an expense of only 1 cent per bushel, which was used to advantage in the furnace, thus increasing the yield of coal per cord of wood. Mr. Mathieu states further, that on different occasions he tried the system of passing the heated products of combustion through a brick kiln filled with wood, and, although occasionally he obtained figures as high as 55 bushels, the usual number was 45 bushels. The difference is accounted for by the difficulties met with in having the gases or products of combustion of the proper chemical composition, containing no free oxygen or excess of carbonic acid, as both will burn wood at this high temperature, producing carbonic oxide. In order to overcome these obstacles, Mr. Mathieu introduced some improvements in his kilns, which consisted in passing the gases after combustion through the wood in the main retort at a sufficiently high temperature to cause the carbonization of the wood, but not at a temperature high enough for the reduction of carbonic acid to carbonic oxide at the expense of the coal. In 1881 Mr. Mathieu started four retorts of his improved pattern at Port Leyden, and, after having tried them long enough to become thoroughly satisfied, the Gere Iron and Mining Company, of that place, erected about 20 more, and constructed a large plant for the manufacture of acetate of lead, acetate of lime and methylic alcohol. Since these experiments at Port Leyden about 128 of these retorts have been erected in Michigan, four in Alabama and six in Canada. Judging from these figures, it would seem that Mr. Mathieu's retorts give exceedingly satisfactory results, and their use seems to be attended both by economy and a very good quality of charcoal.

SCIENTIFIC AND TECHNICAL.

Formation of Ore Veins.

It appears from a recent observation by Dr. Fleitmann, of Iserlohn, Germany, known as the inventor of a process for welding nickel, that the formation of ore veins need not necessarily occupy such long periods of time as we are generally inclined to accord to it. Dr. Fleitmann gave his experience as follows: Some two years ago he had the bottom of a stable pit filled and rammed with common clay containing iron. The pit had served its purpose for storing dung for about two years, during which time, occasionally, to prevent overheating, water had been poured over it; lately it became necessary to remove the pit, when, to the great surprise of Dr. Fleitmann, he found the clay had entirely changed in character, and had become white; it was, moreover, divided in numerous directions by fissures, from 1-25th to 1-6th inch in width, which were filled by compact iron pyrites. The explanation Dr. Fleitmann gives is that the iron oxide of the clay was changed by the water, containing sulphate of ammonia, into sulphate of iron, and the latter had, in accordance with molecular attraction, deposited itself in groups of fissures.

Hydrogen Peroxide.

In a recent issue of *Engineering* we find the following remarks on the above subject: "This pure concentrated body is perfectly colorless, transparent like water, but a little less volatile; it has a peculiar smell, will not freeze, and is decomposed at ordinary temperatures and by a great variety of bodies. It dissolves readily in water, and this dilute solution may be kept for months. A little hydrochloric acid renders it still more stable, while stronger sulphuric acid effects decomposition into water and oxygen. The chemical action of this body is most singular. Chemists generally distinguish between reducing agents, which deprive other bodies of their oxygen in order to become themselves oxidized, and oxidizing agents which give off oxygen and oxidize other bodies. Hydrogen peroxide fills both functions, and the action is often so energetic that explosions occur. Spongy platinum, gold and silver instantaneously decompose it into water and oxygen, while they themselves remain unchanged. Several organic bodies, blood, fibrine and animal albumen act in a similar manner. Certain oxides and peroxides are reduced, the metal itself, or at least a combination less rich in oxygen, being formed. Other bodies, on the contrary, and metals, like iron, are oxidized, arsenious and sulphurous acids being transformed into arsenic and sulphuric acid, while, strangely enough, phosphorus, so easily oxidized, is not attacked at all, and blue indigo sometimes, under certain circumstances, is reduced to white indigo, and the latter reoxidized to its original state. Hydrogen peroxide thus forms one of the strongest reducing as well as oxidizing agents, and its effects in the latter capacity are entirely similar to those of ozone. In fact, of the various tests that have been proposed by Schoenbein, Houzeau and others, for the determination of ozone, there is hardly one which might not work as well in the presence of small quantities of hydrogen peroxide; and whether the air in general or at particular periods contains either one or the other of these bodies, or both together, is by no means certain. The concentrated hydrogen peroxide itself, however, cannot be mistaken. Some years ago great hopes existed as to its value as a bleaching agent; further researches, however, made its usefulness in this capacity very doubtful. There was a somewhat large demand for it at one time for bleaching hair, and Thénard introduced it as an effectual means of restoring pictures the lead paints of which have suffered under the influence of a sulphuretted atmosphere. But it is as yet much too expensive to be largely used."

The Efficacy of Lightning Protectors.

An interesting note on the efficacious protection of a house by a lightning-rod during a storm was recently brought before the French Academy of Sciences by M. G. A. Hirn. The conductor, it was stated, was by no means a good one, and terminated in a piece of iron in a water-cistern or trough standing in the corner of a court. Notwithstanding a terrific thunderstorm which struck the rod, no part of the current left the rod, but all was discharged into the earth. The brass point was, however, fused. Experiments by M. Hirn fully confirm the views of M. Melsen, that lightning-rods should end in metal masses, such as pipes, and not in so poor a conductor as water. When there is a flaming discharge seen at the point of a lightning-rod it is a proof that the rod is not a good one, for M. Hirn has proved that these rods act busily during a thunderstorm in giving off a silent discharge. This was demonstrated by means of an electro magnet in a derived circuit from the rod. When the storm passes the zenith the bars become magnetized, and the same effect is shown by connecting a galvanometer in the circuit of the rod.

Engineers' Club of Philadelphia.

At a recent meeting of the Engineers' Club of Philadelphia, Mr. John Haug presented a copy of Lloyd's rules for iron ships, and submitted the following interesting table of the number and tonnage of ships built in Great Britain in 1881:

Vessels.	Built in 1881. Number.	Built in 1881. Tonnage.	Built in 1881. Material used. Tons.	Lost, 1881. Number.	Lost, 1881. Tonnage.
Steel steamers	34	68,366	32,000	1	1,536
Steel sailing vessels	3	3,167	1,500	.....	.....
Iron steamers	411	500,503	30,000	139	138,770
Iron sailing vessels	53	68,650	34,000	52	47,936
Wooden steamers	30	1,659	.....	18	1,764
Wooden sailing ves.	259	16,448	.....	821	165,979
Total	787	743,793	.....	1,031	354,125

It was stated that the principal changes in the rules for 1882 have been in water-tight bulkheads, of which more are now required in longer and larger vessels, and they are to be extended to the principal upper deck. Vessels of extreme proportions (over 11 depths in length) have to be more thoroughly strengthened in their top and bottom members, by doubling strokes, &c. Treble-riveted buttstraps are required to a greater extent, as forming stronger joints. The rules for boilers, machinery, pumping arrangements, spare parts for machinery, &c., have been extended and improved, with a view to greater safety at sea. As ship-building of steel is increasing, a reduction of 20 per cent. from the scantlings required for iron is permitted, giving ships so much more carrying capacity. A complete set of rules for testing all materials insures uniform quality in steel used. Steel castings by the Siemens-Martin or Bessemer process are also now used, in place of large and expensive forgings, for stemports, rudders, stems, &c., and they have been found strong and tough, less expensive than scrap-iron forgings, and the risk of bad welds and inconvenience of rough and uneven shape is avoided. The latest circular issued by *Lloyd's Register* offers to fix a proper load-line for each vessel, according to its style, form, &c.; thus the rules not only provide for its proper strength, but also its sea-going qualities, &c. This is of the greatest importance, in view of the many disasters that have occurred from the want of those qualities. Mr. Haug also exhibited and described drawings of his own and other valve gears.

Mr. Charles G. Darrach read a paper entitled "Some Notes on the Pollution of Water," in the course of which he pointed out the various sources of contamination, both artificial and natural, and suggested how collecting reservoirs should be built in order to avoid the various troubles indicated.

A Narrow Gauge Mining Railway.

A narrow-gauge railway which leads from Lahn river, in Prussia, to the Friedrichssegen mine, near Oberlahnstein, possesses several features of interest, and a short description will therefore, in all probability, be found acceptable. The railway has for its object the transportation of the ores from the lead and silver mines of Friedrichssegen to the smelting furnaces, and to convey coal, lime and other materials at the same time. The mine in question is situated at the top of a hill, and special provisions were therefore necessary in order to insure the successful working of the railway. It is constructed on the compound system, partly with flat rails and partly as a cog-wheel line. Its gauge is 3.28 feet, its total length 1.66 miles, and the highest gradient of the flat-rail part of the line is in the proportion of 1 to 20, while the highest gradient of the cog-wheel line is in the proportion of 1 to 10, the aggregate length of the cog-wheel line being about 676 yards. The locomotive is built on Riggenbach's system, and its cylinder is 9.45 inches in diameter, with a stroke of 17.7 inches. It is a double-shaft tender engine, and the diameter of the driving wheels for the flat rail is 30.315 inches, and that of the pitch circle of the cog wheel working on the toothed rails is 30.08 inches. This difference of about one-fourth of an inch makes the engine act partly by pressure also in the cog-wheel portion of the line. The length of the boiler is 6 feet 6 inches, its total heating surface 269 square feet, and the grate surface 6.674 square feet. There are 75 boiler tubes, varying in diameter from 1.6 to 1.77 inches. With a view to secure smooth working, the rack is made of U iron and the cogs are made of rolled iron, with beveled sides, and fastened with rivets between the flanges. The pitch of the division is 3.937 inches.

The aggregate cost of the construction of this line, including one engine and 24 vehicles, amounted to something over $41,000, being at the rate of about $24,700 per mile. As far as the working expenses are concerned, the following data give some interesting particulars. In the financial year of 1881–82 the quantity of ore conveyed down hill amounted to 32,314 tons and the materials conveyed up hill to 5200 tons. The working expenses, inclusive of depreciation, amounted to about $4550, this being at the rate of about 12 cents per ton and statute mile. In 1879–80, prior to the erection of the line, the quantity of ore conveyed by horses down hill amounted to 18,000 tons, and the expense attending this method of conveyance was no less than $9375, showing that the conveyance by rail offers strong pecuniary inducements. In comparing the cost of working this line with that of a line in Würtemberg which is also worked by cog-wheels, and with that of several wire-cable lines, it is found that, financially speaking, cog-wheel lines approach very closely to wire-cable lines whenever the ground offers special difficulties, and it is thought that the success achieved with the line here considered will lead to the adoption of similar systems of conveyance in other mining districts.

METALLURGICAL NOTES.

The Basic Process in Germany.

At the recent meeting of the British Iron and Steel Institute, at Vienna, Mr. Sidney Gilchrist gave a short account of the basic process as now conducted in Germany. Mr. Gilchrist had given some attention to the works at Teplitz, and stated that they were now turning out more basic steel than they did acid steel two years ago. It was stated that the work turned out would compare favorably with that done in England, the machinery employed, at the same time, being less costly. Two converters are now in operation at the works in question, turning out some 3000 tons of steel per month, and the converter bottoms are found to last about as long as the linings—from 30 to 40 charges. This result has not yet been attained in Great Britain, although repeated efforts have been made for that purpose. The converter bottom used at Teplitz is made entirely of bricks. The tuyeres are in an inclined position, and two rows of bricks are put in flat and one row on their ends, but following the inclination of the tuyere and joint, and the results thus far attained have, as above stated, given highly satisfactory results. When turning out acid steel at Teplitz, the converter bottom, on an average, lasted for 110 blows, this having never been done in England. The pig used is Ilsidora pig, and contains about 3 per cent. of phosphorus, from 2 to 2½ per cent. of manganese and ½ per cent. of silicon, the minimum of sulphur being about 0.75 per cent.

Treatment of Silicious and Aluminous Ores.

Mr. J. P. Kagenbusch, of Lambeth, England, proposes the extraction and separation of precious and other metals in an improved and economical manner from silicious, aluminous and other substances, and to apply the process at the same time for obtaining and manufacturing aluminium bronze from the aluminous residues produced. In carrying out the first part of his invention Mr. Kagenbusch first pulverizes and then roasts the ores with charcoal or some other carbonaceous substance, the time required for roasting depending upon the component parts contained in the minerals treated. When the roasting is completed the hot ore is thrown into cold water, well stirred and washed. The substances treated are then dried and mixed with suitable fluxes, always having a certain quantity of soda-ash or potash in the mixture, so as to bring the silica and alumina, chemically combined with the metals, into a soluble state. When thoroughly mixed, the mass is placed in crucibles and subjected to a white heat, and after smelting and the addition of copper and zinc, by which a more complete separation of the metals from the various impurities is effected, mechanical separation is resorted to and the soluble matters removed by washing. If the slag or dross thus obtained is found to contain further alumina, an additional quantity of metallic granulated copper is added, this quantity being regulated by the amount of alumina ascertained to be present, and the mass is again fused and well stirred from time to time. The copper will then combine with the aluminium in the alumina, and separation from the dross may be effected in a manner similar to that described above.

The Miantonomah.

The iron-clad monitor Miantonomah, which has been at League Island since September, 1880, is now ready to go to sea. The vessel has been fitted up with the most elaborate machinery, and at least 52 engines are said to be stationed beneath her docks. Owing to a serious derangement of the air pump in connection with the engines, the vessel was delayed somewhat longer than was anticipated. The pump was designed by the Navy Department, and built by John Roach, at Chester, Pa., and could be operated independently of the engines themselves, the advantage of this arrangement being that the low-pressure engines could be started as promptly as the others, thus greatly adding to the efficiency of the combined engines. Failure of the pump to act properly resulted in the stoppage of the engines, and, consequently, disabled the vessel. Tests of this important part of the Miantonomah's machinery, made under the supervision of naval officers, had been very unsatisfactory. The engines working the pump would work only a very short time, and even then very badly. The result of many trials was that the pump was condemned both by the naval experts and by Mr. Roach, the builder. Even with the help of an auxiliary engine the pump failed, and its condemnation was so final that drawings for a new one were ordered to be made. Master-Mechanic John Rowbotham, however, was not satisfied to allow the pump to be taken out without an attempt to remedy its defects, as the removal could not be accomplished without either tearing up the heavy iron-plated deck or breaking the engine to pieces. At his suggestion a number of alterations were made, the valves were entirely reconstructed and the fly-wheels properly balanced. Subsequent trials showed that with these changes the pump gave entire satisfaction, and the auxiliary engine could be dispensed with. This result is considered by the officers at League Island as a great triumph for the mechanical department, and will save the Government a considerable sum.

Never has the position of the expert witness been more difficult, or attended with greater responsibilities, than at present. He owes to the subject of which he speaks competent and unbiased consideration, and to the public who receives his words a candid and accurate statement of all the facts. Duty demands nothing else, while the loss of reputation and honor will be the price of disloyalty. Whether acting in a court of

law as a committee or individual, the case is the same. In the trial of legal causes the opinion is gaining current that experts should be employed by the court, and that their position when employed by a party to the litigation is necessarily an inconsistent one. As a member of a committee the expert is none the less interested to act in an unbiased manner. In such a case he is before a court of public opinion—that court of last resort which sooner or later will pass judgment to the profit or cost of every one.

A Great Oregon Enterprise.—According to the *Morning Oregonian*, of Portland, Ore., a great industrial enterprise is now definitely announced to be undertaken. For a year or more preparations have been making for the organization of a great company to establish iron works on a grand scale at Oswego. The property has now been secured, the company organized, and a resolution adopted to erect as soon as possible extensive smelting works and rolling mills, and the names of the capitalists who have undertaken it are said to be a sufficient guarantee of its success. Some three months ago articles were filed incorporating the Oregon Iron and Steel Company, with a capital of $3,000,000, its object being the establishment of a rolling mill in Oregon. This was all that could be definitely learned about it, but since that time the promoters of the enterprise are said to have been quietly buying such property as they needed. This, we understand, embraces the property of the Oswego Iron Works, including furnace, ore mine, canal, water-power, and 24,057 acres of land. It is the intention of the company to begin the erection of the works early in the spring, and possibly during the winter if the weather is suitable.

Some interesting figures have recently been submitted in regard to John Cockerill's Iron Works, at Seraing, Belgium, which relate to the past financial year. It appears from these that the aggregate value of the output of the works amounts to 42,910,000 francs (one franc equals about 19 cents), or about $8,153,000. In no previous year had the production risen to such a figure, and in the year 1873–74 it did not exceed 40,000,000 francs. The export business of the works amounts to almost 29,000,000 francs, including the profit derived from this department. The aggregate turnover, embracing purchases and sales, for 1881-82 amounts to 42,172,350 francs, and the gross profit obtained in the various departments is 3,473,183 francs. Deducting from the gross produce 50,000 francs as a contribution to the Poor Relief Fund, in accordance with the precedent of former years, there remains a profit of 3,423,183 francs, which is brought up to 3,781,652 francs by adding various amounts from the side of the profit and loss account; in the previous year the corresponding figure was 3,278,235 francs. On the debtor side of the same account appear: A discount of 3 per cent. for buildings and 10 per cent. for machinery, pursuant to by-laws, 2,151,964 francs, leaving a balance of 1,629,687 francs.

Owing to the prevalence throughout the United States and the Provinces of Canada of an electric storm of unusual severity, communication both by land and cable was seriously interrupted a short time ago. Experienced telegraph operators express the opinion that it was one of the most severe storms of the kind that had occurred for a number of years; the very few wires that could be operated were continually liable to disturbance, and it was consequently impossible to send messages of any great length.

Special Notices.

Removal.

JOSEPH J. LIPPINCOTT & CO.,

dealers in Scrap Iron, have removed from No. 112 South Fourth street to No. 131 South Fourth street, Philadelphia, Pa.

Wanted.

A First-class Traveling Salesman

for large cities West and Southwest, to sell Fancy and Upholsterers' Hardware. Must be a tip-top man, with long experience and good reference. State salary expected and per diem expenses. No trunk to carry.

Address PICTURE NAIL.
Office of *The Iron Age*, 83 Reade st., New York.

Wanted.

Partner with $7000 to $8000, to take one-half interest in an old and well-established Hardware, Stove and Implement Business in a town of 3000 inhabitants in Southwestern Ohio, where there is but very little competition. The business this year will amount to over $75,000. I have two reasons for taking a partner. One is, too much business for one man; the other is, I wish to increase the trade to $100,000 during the year 1883. No one need apply unless they understand the Hardware trade thoroughly, and is a live and energetic man, and can come well recommended. Address,
LOCK BOX 372, Lebanon, Ohio.

Wanted.

A first-class Salesman familiar with the Iron, Heavy Hardware and Carriage Goods business, to travel in Missouri, Kansas and Nebraska. Best of reference required.

Address X. Y. Z., care Carrier 28,
St. Louis, Mo.

WANTED.—A position in a hardware house by an experienced salesman. Speaks Spanish and is well acquainted with the trade of the Southwestern States and Territories. Best references; salary expected small at present. Address
"IRON," 96 Washington Ave., Brooklyn, N. Y.

DRILL PRESS FOR SALE.—New Upright Power Drill Press, swings 21 inches, back geared, quick return motion, steel spindle, superior finish; weight, 1200; hight, 6 feet; price, $210.
PEERLESS PUNCH AND SHEAR CO.,
38 W. Dey St. New York.

Special Notices.

For Sale.

Palo Alto Rolling Mills,

Near Pottsville, Pa.,

ON THE MAIN LINE OF THE POTTSVILLE AND READING RAILROAD.

These mills are in good repair, and can be started in two days' time.

Rolls for T-Rails 12 to 70 lbs. per yard, and for Street Rails 18 to 70 lbs. per yard.

Guide Mill Train for Merchant Iron ¼ to 1 inch.

Rolls for Merchant Bar, round and square, up to 4½ inches.

Number of Puddling Furnaces in both mills, 30; Heating Furnaces, 9; all with boilers attached.

Also Foundry, Machine Shop, Blacksmith Shops, Iron House, Roll House, Carpenter and Pattern Shops, Stables, handsome Dwelling for Superintendent, 11 Tenement Houses, a Brick Office, and ample grounds for stock and cinder.

For further particulars address

Messrs. LEE & McCAMANT, Extrs.,
Pottsville, Pa.

THOS. F. WRIGHT, 1804 Race St., Philadelphia, Pa.
HUGH W. ADAMS, 56 Pine St., New York.

For Sale.

Engine Lathe, 90 in. swing, 20 ft. bed. 2d hand.
Engine Lathe, 43 in. swing, 14 ft. bed. New.
Engine Lathe, 23 in. swing, 16 ft. bed. 2d hand
Engine Lathe, 19 in. swing, 7 ft. bed. 2d hand.
Engine Lathe, 14½ in. swing, 6 ft. bed. 2d hand.
Lot other sizes, 2d hand and new.
Iron Planer, 50 in. x 50 in. x 16 ft. 2d hand.
Iron Planer, 36 in. x 36 in. x 9 ft. 2d hand.
Other sizes new.

J. M. BADGER,
5 Dey st., New York City.

Factory to Rent.

Three substantial and convenient brick buildings, containing about 50,000 square feet, situated at Bridgeport, Conn., and within five minutes' walk of the depot. Each building fronts on the street, thus securing excellent light and ventilation. Gas throughout. Two of the buildings are fitted for steam heat. A 40-horse-power engine (almost new), with boiler, shafting, &c., will be rented with the property, or sold, if desired. Large natural springs of water (besides the city supply) on the premises. Elevator, fire escape, fire-proof vaults and other advantages, making it an exceedingly desirable property for manufacturing purposes. Will lease the entire plant or either building, and if but a portion is leased, arrangements can be made for heat and power, if needed. Cheap and convenient freighting facilities. Apply to

THOMAS STIRLING,
Bridgeport, Conn.

BROWN & SHARPE MFG. CO.'S
GRINDERS FOR SALE.

We have of above manufacture 4 Grinders, which are in good order, never having been used. They are so adjusted to grind outside circular work, either straight or tapered, grinding so great a taper as 10 inches to 1 foot. They were built specially for us, but we have changed our plans, will have no use for them, and will sell at a bargain. PITTSBURGH TOOL CO.,
P. O. Box 1060.

For Sale.

A large and well-selected stock of Hardware, in one of the most flourishing villages in Northern New York. Stock will inventory about $5000. A very desirable opening for any one wishing to go in the business. Locat on good and good trade. Sales $25,000 past year. Correspondence solicited.
Address P. O BOX 889, Glens Falls, N. Y.

For Sale.

WASHOE MACHINES

For making Picks, and Mattocks, with solid punched eyes. Address

T. & Co.,
Box, 25,
Office of *The Iron Age*, 83 Reade St., New York.

Notice.

I wish to call the attention of Rolling Mill proprietors, where old rails are used, to my invention on roughing rolls. By the construction of my first and second grooves, I am enabled to take two old rails as a pile and do as good and as much work as can be done with a 4 in. x 4 in. square pile. I will sell on reasonable terms. For further particulars apply to

JAMES THOMAS,
Roll Turner Steel Works,
So. Pueblo, Colo.

To Hardware Manufacturers.

An experienced Hardware Salesman, now organizing a line of agencies, to represent "on the road" in the Southern States, solicits proposals from manufacturers desiring to be represented in that section.

Address SALESMAN,
No. 330 N. Eutaw st., Baltimore, Md.

Rolling Mill Engine.

Wanted, a second-hand Horizontal Engine, cylinder about 20 in. x 48 in., fly-wheel 18 to 20 tons, complete and ready for use. Name lowest cash price.

LLOYD & LINDSAY,
328 Walnut Street, Philadelphia.

Wanted.

A competent foreman to take charge of work in the Missouri Valley Bridge and Iron Works, at Leavenworth, Kan. Must understand the manufacture of iron bridges thoroughly, and be also a competent machinist. Address, giving experience, references and salary required,

A. J. TULLOCK, Supt.,
Leavenworth, Kan.

Wanted.

A thorough, capable Foundryman who fully understands and is competent to take entire charge of manufacturing department of Malleable Iron Works in Chicago.

Address, stating salary and references,
MALLEABLE IRON,
Office of *The Iron Age*, 36 & 38 Clark St., Chicago.

Wanted.

A Thoroughly Posted Hardware Man, to Travel.

One for Pennsylvania and one for Ohio and Indiana. Address

BINDLEY HARDWARE CO.,
Pittsburgh.

Special Notices.

For Sale. Rolling Mill,

At CINCINNATI, OHIO.

10 Single Puddling Furnaces.
2 Scrapping Furnaces.
4 Heating Furnaces.
1 New 8-in. Hoop Train.
1 18-in. Sheet Train and Annealing Furnace.
1 Compound Muck and Bar Mill.
Engines, Boilers and Fixtures complete.
Grounds, 300 x 320.

Annual capacity, single turn, 5000 tons. Will sell machinery and fixtures, and secure favorable lease or sale of grounds.

Cincinnati is one of the largest hoop markets in the country, and there is no other hoop mill in the city.

Address,
P. O. BOX No. 297,
CINCINNATI, O.

For Sale.

THE REHOBOTH FURNACE,

Located at Iron Station, N. C., on the line of a leading railroad. In complete running order. Capable of turning out 10 tons of Charcoal Pig Iron per day, which will cost not over $18 per ton. It is a very tough, strong iron, suitable for car wheels or any other work where strong iron is required. Charcoal in abundance at 5 cents per bushel. Labor from $1 to 75 cents a day; cost of ore $2 per ton, delivered at furnace; two tons of ore make a ton of pig iron. For further particulars address JOHN LEONARD & CO.,
445 West St., New York,

For Sale.

Rolling Mill & Nail Factory on P. R. R.

Eight single Puddling Furnaces.
Three Heating Furnaces.
One 16 in. Bar Mill Train.
One 8 in. Guide Mill Train.
One Rotary Squeezer with Muck Mill.
One Nail Plate Mill.
Brick Nail Factory, with 20 Nail Machines, iron and Nail Warehouses, &c.

The above works are now running on both day and night turns, and have been in successful operation for a number of years. Property must be sold to close an estate. For further information address
ADMINISTRATOR,
Office of *The Iron Age*, 83 Reade St., New York.

For Sale.

Foundry in Cleveland, Ohio.

Has good established trade and runs 30 to 40 molders year round. Reason for selling, ill health of proprietor.

Address F. E. S.,
Office of *The Iron Age*, 83 Reade St., New York.

Manufacturing Property for Rent.

A very desirable location for manufacturing purposes. Situated on the line of the Pittsburgh and Lake Erie Railroad, thirty miles west of Pittsburgh. A substantial building, two stories, 80 x 40 feet, supplied with a first-class water power. The facilities for shipping to all parts of the United States are unsurpassed. To a desirable tenant liberal arrangements will be made.

For further information apply to
W. P. TOWNSEND & CO.,
21 Market st., Pittsburgh, Pa., or New Brighton, Pa.

JUST PUBLISHED.

DIRECTORY

TO THE

IRON AND STEEL WORKS

OF THE

UNITED STATES,

BY THE

American Iron and Steel Association.

This work embraces Lists with very full particulars of all Iron and Steel Works in every State and Territory, classified under the following headings:

Blast Furnaces.
Recently Abandoned Furnaces.
Rolling Mills and Steel Works.
Recently Abandoned Rolling Mills.
Recently Abandoned Steel Works.
Rail Mills.
Bessemer Steel Works.
Crucible Cast Steel Works.
Open Hearth Steel Works.
Steel Manipulating Works.
Miscellaneous Steel Works.
Forges.
Bloomaries.
Recently Abandoned Forges & Bloomaries.
Wire Rod Mills.
Car Axle Manufactories.

192 Pages, 8vo., Cloth.
PRICE, $3.

Sent postpaid to any address on receipt of price by

DAVID WILLIAMS,
Publisher and Bookseller,
83 Reade Street, New York.

Carriage Goods Traveler Wanted

FOR FOUR MONTHS.

First-class man acquainted with the Carriage and Wagon trade, and Carriage Goods trade, in New York, New Jersey, Pennsylvania, and the New England States. Must be familiar with springs, axles, &c. Address
"CARRIAGE GOODS,"
Office of *The Iron Age*, 83 Reade St., New York.

CORRESPONDENCE IS SOLICITED
with parties having
MACHINERY TO BUILD,
Heavy work preferred.
Address
THE HARTFORD ENGINEERING CO.,
Hartford, Conn.

To Brass Foundries.

To Brass Manufacturers.

Our new foot press, for cutting off GATES from brass castings by FOOT power, is now ready. Weight, 250 lbs. Price complete, $50, net. A boy can operate it easily. We warrant them to give the most perfect satisfaction. PEERLESS PUNCH AND SHEAR CO.,
38 W. Dey Street, New York.

WANTED.—A gentleman with over twelve years' experience at the Hardware trade, for the past few years representing one of the first houses in Chicago, wishes to make an engagement with a live Eastern house to represent them in West. Address, E. C. C., care C. H Fuller, 69 Dearborn st., Chicago, Ill.

WANTED.—By a practical man, a position as Rolling Mill Sup't. Have had twelve years' experience in superintending the general manufacture of R. R. supplies. First-class references, and good reasons for desiring a change. Address
BAR,
Office of *The Iron Age*, 83 Reade St., New York.

Special Notices.

E. BISSELL & CO.,

WHOLESALE AUCTIONEERS.

CLEARING OUT SALE OF CUTLERY, COMPRISING ABOUT 600 LOTS OF

TABLE CUTLERY, CARVERS, &c.,

—ON—

Wednesday, Dec. 6th,

AT 10 O'CLOCK, A. M.,

At 83 Chambers and 65 Reade Sts.,

NEW YORK.

This sale will comprise a large assortment of Table Knives and Forks and Table Knives only, in Bone, Cocoa, Ebony, Celluloid, Rubber and Pearl; a large line of Carvers, desirable patterns; also, Plated Knives, Tea and Table Spoons and Forks; good goods on 18 per cent. nickel silver, 4, 8 and 12 oz. plate; also, cases Plated Knives, Forks and Spoons, fine goods. This sale will comprise a good many goods suitable for the Holiday Trades, and buyers should not fail to attend.

Tuesday, Dec. 12th,

BY ORDER OF A LARGE MANUFACTURER,

SPECIAL SALE OF

FINE PLATED WARE,

COMPRISING IN PART

Tea Sets, Cake Baskets, Urns,

PITCHERS, FINE CASTORS,

Pickle and Berry Dishes, Tea and Coffee Pots, &c.

NOTICE

TO MANUFACTURERS OF AGRICULTURAL IMPLEMENTS.

Chilean Consulate, Philadelphia, Pa.

PHILADELPHIA, 532 Walnut St.,
November, 1882.

I am instructed by the Minister of Chile to the United States to procure and forward to Chile models, drawings, designs, plans or engravings of *all implements used in agriculture* of every description in the United States, together with the names of the manufacturers, their addresses and their circulars, catalogues and price lists, with the view of encouragement in trade between the two countries. Manufacturers will send me such of the foregoing as they may be willing to place at my service for the purpose aforesaid, and in event of models being sent to me I request that they be securely boxed ready for transportation. All of the foregoing to be sent to me free of charges. In the use of the term "agricultural implements," I mean, in addition to such articles as are usually known as such, to include all such implements and machinery as are used in converting the products of the farm and field into service, as, for instance, churns, corn-shellers, mills, grinders, etc. Manufacturers and others will respond at once to

EDWARD SHIPPEN,
Consul of Chile.

For Sale.

One 6 ton Anvil Block and Die. Also pair Power Shears, suitable for ¾ in. iron.

J. H. KOLB,
North 10th and 5th Sts., Brooklyn, E. D., N. Y.

A Large Foundry and Machine Shop,

Centrally located, using Soft and Chilling Irons largely, desires to add more manufacturing—something in the line of Railway equipment preferred—to its already established trade. Address,
FOUNDRY, BOX 22,
Office of *The Iron Age*, 83 Reade St., New York.

For Sale or Lease.

A Large Two-Story Brick Factory,

formerly Machine Works, at Pearl River, N. Y., on railroad depot, 25 miles from New York City. Railroad facilities unexceptionable on the line of the New Jersey and New York Railroad. The property contains 40,000 square feet floor space, with one 80 H. P. Engine and Boiler, 700 ft. 2-inch line shafting and pulleys, main belts, steam heating and water pipes throughout the building. A splendid iron foundry, 70 ft. by 90 ft., with one iron smelting cupola with Mackenzie blower, brass furnace, core oven, blacksmith shop, pattern vaults, annealing oven, etc. The property can be bought or leased on liberal terms. For further particulars, price, terms, etc., address
J. E. B. & CO.,
113 Liberty st., New York City,
Or Pearl River, Rockland Co., N. Y.

Wanted.

A Partner with $3000 to $10,000 in a Foundry and Machine Business, established in 1824. For particulars, inquire of

I. H. COLLER,
Poughkeepsie, N. Y.

IRON AND METAL

Exchange Memberships

Bought and Sold by
WM. WILLIS MERRILL,
4 Stone Street, Room 69.
Dealer in
EXCHANGE MEMBERSHIPS.

Wanted.

Air Compressor and Pipe.

A good second-hand air compressor, with a capacity of at least 1000 cubic feet free air per minute. Also 1500 ft. 4½ to 5½ in. pipe and 1000 ft. 1 in. to 3 in. Address, with full particulars,
THE ROBINSON COAL CO.,
Coalburgh, Kanawha Co., W. Va.

A Paying Investment.

Wanted by two parties, with good references, well acquainted with the Southern trade, a special partner with $10,000 to $20,000, to engage in jobbing Hardware business in one of the best located cities of Georgia. For full particulars address
A. & B. SPECIAL PARTNER,
Office of *The Iron Age*, 83 Reade st., New York.

WANTED—From January next, a traveling salesman who can command a good trade in the larger cities east of the Mississippi, for Fine Pocket Cutlery, &c. Only one who has a thorough knowledge of the trade need apply, with best references. K. E.,
Office of *The Iron Age*, 83 Reade St., New York.

Special Notices.

NEW IRON WORKING MACHINERY.

ENGINE LATHES.

36 in. triple geared (bed to suit). Fitchburg.
28 in. swing, 18 foot bed. Fitchburg.
26 in. swing, 18 foot bed. Fitchburg.
24 in. swing, 14 and 16 foot bed. Fitchburg.
22 in. swing, 12 and 14 foot bed. Blaisdell.
20 in. swing, 14 foot bed. Fitchburg.
20 in. swing, 12 foot bed. Fifield.
19 in. swing, 10 and 12 foot bed. Gray.
18 in. swing, 10 and 12 foot bed. Blaisdell.
17 in. swing, 6 foot bed. Johnson.
16 in. swing, 6 and 8 foot bed. Fitchburg.
14 in. swing, 6 and 8 foot bed. Fitchburg.
13 in. swing, 6 and 8 foot bed. Blaisdell.
No. 2 Cabinet Turrett Lathe, 18 in. by 6 ft.
No. 1 Sq. Arbor Fox Lathe, 14 in. by 5 ft.
No. 2 and 3 Fox Brass Lathes.

PLANERS, SHAPERS & SLOTTERS.

36 in. x 36 in. x 9 foot Planer (2d hand; good order Wheeler.
30 in. x 30 in. x 8 foot Planer. Fitchburg.
26 in. x 24 in. x 6 and 7 ft. Planer. Wheeler.
26 in. x 26 in. x 8 foot Planer. Fitchburg.
22 in. x 20 in. x 4 foot Planer. Wheeler.
18 in. stroke Shaper. Gould & Eberhardt.
10 in. stroke Shaper. Gould & Eberhardt.
10 in. stroke Shaper. Fitchburg.
32 in. Slotter (swing 36 in.) Hewes & Phillips.

DRILL PRESSES.

48 in. Radial Drill, double-geared, self-feed, slotter and planed bed. Betts.
30 in. back-geared, automatic. Prentice.
28 in. back-geared, self-feed. Fitchburg.
25 in. quick return. Blaisdell.
19 in. quick return. Blaisdell.
18 in. quick return. Fitchburg & Blaisdell.
2, 3 and 4 spindle drills. Garvins.
No. 2 (⅝ x 150) Bolt Cutters. Merriman's.
Power and Hand Millers. Garvins.

These tools are on hand and for quick delivery.

KELLY & LUDWIG,
49 and 51 North 7th St.,
PHILADELPHIA, PA.

For Sale.

BOLT HEADERS.

One Burdick Header.
One Improved Lewis, Oliver & Phillips style.
Two Chapin Headers,
Five National Headers.
National Hot-Pressed Nut Machine.
And complete outfits for Bolt and Nut manufacture. Apply

NATIONAL MACHINERY CO.,
Cleveland, Ohio.

Specialists in this line of machinery.

For Sale.

35 Horse Portable Engine and Boiler, in excellent condition, with governor, grates and smoke stack; shell of boiler ⅜ in. thick; weight complete, 10,000 lbs.; price, $825. Also, 6, 8, 10, 12, 15, 18 and 25 horse-power engines. Boilers, pumps and other machinery at low prices.

S. M. YORK,
Cleveland, O.

New Machinery For Sale.

One Power Bolt Cutter, ¼ in. to 1¼ in. Six Emery Grinders. Two Milling Machines. One 28 in. Drill Press. Three Hand Lathes. Two 20 in. Drill Presses. One 14 in. x 40 in. Screw Cutting Lathe. One 12 in. x 44 in. Screw Cutting Lathe. One 9 in. x 44 in. Screw Cutting Lathe. One Medium Band Saw. One 24 in. Scroll Saw. Gear Cutting Attachments for Lathes. One Second-Hand 6 H. P. Baxter Engine. One Second-Hand 24 in. Pony Planer. Shafting, Hangers, Pulleys, &c.

JACKSON & TYLER,
16 & 18 S. Howard Street, Baltimore.

For Sale.

Stanhope Furnace, and a Farm of 140 acres, with 20 dwellings, houses, barns, &c., &c. Capacity of Furnace 150 tons per week. Was thoroughly overhauled in 1880, and was in blast but two months in 1881. Inquire of

THOMAS COOCH,
Pottsville, Pa.

Foreclosure Sale

OF ROLLING MILL PROPERTY.

The property of the Po'keepsie Iron and Steel Co., consisting of Rolling Mill buildings, with the entire Plant, Machines and Tools, about 31 acres of land, old Mansion with large and valuable water front, &c. &c., will be positively sold on Saturday December 9th, at 12 o'clock noon, at the Court House, Po'keepsie. This sale is well worth the attention of parties looking for this kind of property. For other information address

W. S. JOHNSTON, Trustee
For Bondholders.

FOR SALE.

1 Horizontal Engine, 12 x 24.
1 Horizontal Engine, 12 x 14. Aut. Cut-off.
1 Horizontal Engine, 10 x 14.
1 Horizontal Engine, 8 x 12.
4 Horizontal Engines, 8 x 10.
2 Horizontal Engines, 6 x 12.
2 10 Horse-Power. Aut. Vertical.

All new and first-class make. Boilers to suit the above, also of all sizes.

JOSEPH LUMLEY,
144 N. 3d St., Philadelphia, Pa.

Lathes for Sale at Low Prices.

One 30 in. x 10 ft. bed, one 17 in. x 11 ft. bed, Hewes & Phillips. One 16 in. Pond and two 13 in. Lathes.

The above will be delivered in first-class order.

GEO. A. OHL & CO.,
East Newark, N. J.

Corliss Engines For Sale.

PROMPT DELIVERY.

One—22-inch cylinder, 36-inch stroke, at once.
One—14-inch cylinder, 36-inch stroke, in two weeks. Apply to

THE GEORGE PLACE MACHINERY CO.
121 Chambers and 103 Reade St., New York.

For Sale.

Second-hand

DROPS and LIFTERS.

BEECHER & PECK,
Lock Box 122, New Haven, Conn.

The Sherman Process Co.

9 Pemberton Square, Boston, Mass.,

Issue Licenses to use the Process for the Manufacture of Iron and Steel

In the Bessemer Converter, Crucible, Siemens-Martin, Puddling, Blast and Cupola Furnaces.

The use of this Process improves the quality of the product, saves fuel and labor, and does not require any change in furnace or manner of working. See page 17 of *The Iron Age* of Oct. 25th, 1877.

Trade Report.

BRITISH IRON AND METAL MARKETS.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, TUESDAY, Nov. 28, 1882.

Scotch Pig.—The market is dull, with but little inquiry, and prices are weak and lower. We quote makers' prices as follows:

Langloan, alongside, Glasgow			67/6
Coltness,	"	"	68/6
Gartsherrie,	"	"	64/
Summerlee,	"	"	63/6
Carnbroe,	"	"	57/6
Glengarnock,	"	Ardrossan	57/
Eglinton,	"	"	51/6

Lighterage from Ardrossan to Glasgow is 2/ @ 2/6 ₱ ton.

Cleveland Pig.—The demand is falling off and prices are nominal. We quote as follows, f.o.b. shipping ports:

Middlesboro' No. 1 Foundry		47/6
" No. 2	"	47/
" No. 3	"	43/6
" No. 4 Forge		43/

Bessemer Pig.—The market continues dull and prices weak and tending downward. We quote W. C. Hematites, mixed lots, Nos. 1, 2 and 3, equal portions, 54/6 @ 56/.

Blooms.—There is no business doing and prices tend downward. Bessemer Blooms, 7" x 7", are quoted £4. 10/ @ £4. 15/.

Manufactured Iron.—The market is quiet, with fair business doing. Prices are steady. We quote at works:

		£	s.	d.		£	s	d
Staff. Ord. Marked Bars		7	10	0	@	8	0	0
" Medium "		7	5	0	@	7	15	0
" Common "		6	10	0	@	7	0	0
Hoops, 20 W. G. and over.								
" Common Best		8	10	0	@	9	0	0
" Medium		7	10	0	@	7	15	0
" Common		7	0	0	@	7	10	0
Sheets, 20 W.G. & under.								
" Ordinary Best		10	0	0	@	11	10	0
" Common		9	0	0	@	9	10	0
Welsh Bars		5	12	6	@	5	15	0

Steel Rails.—The demand continues light and prices weak. We quote Ordinary Sections, £4. 17/6 @ 5. 12/6, f.o.b. shipping ports.

Iron Rails—Nominal; Welsh, £5.

Old Rails.—The market is dull, with moderate offerings and no sales. Prices are weak. We quote, nominally: Old Tees, c.i.f. New York, £3. 17/6 @ £4, and Old D. H's., £4. 5/, same port.

Scrap.—The market is dull, with offerings and sales small, and quotations are nominal. Heavy Wrought is quoted, nominally, c.i.f. New York, £3. 14/ @ £3. 16/6; Bessemer Crop Ends, run of the mill, are quoted 60/ @ 62/6, f.o.b. shipping ports.

Copper.—The market is quiet and steady, with fair business doing. We quote: Best Selected, £74 @ £75, and Chili Bars, £66. 15/ @ £67. 5/.

Tin.—The market is quiet, with fair demand, and quotations are higher, with further advance probable. We quote: Straight Tin, Spot £99 @ £99. 15/, and futures, £100 @ £100 15/.

Tin Plates.—The market continues dull, and prices weak. We quote:

Tin Plates, 10 x 14,	1st qual.	Charcoal	20/ @ 22/
" "	2d "	"	18/ @ ....
" "	1st "	Coke	17/ @ 17/6
" "	2d "	"	15/ @ 15/6

Spelter.—The market is steady, with good business doing. We quote: Ordinary at shipping ports, £16. 15/ @ £17.

Lead.—The market is quiet and prices are lower. Common English Pig is quoted, £13. 15/ @ £14.

FINANCIAL.

Office of THE IRON AGE,
TUESDAY EVENING, November 28, 1882.

Easy money and more buoyant stocks mark the close of the week under review, but in commercial circles it may be said that the general tone is tame and quiet, differing little from the situation noted one week ago. At our mercantile agencies it is remarked with reference to occasional failures reported, that there are always a few who are looking out for "a proper time to fail," and the nearness of another year makes the moment opportune. In some departments business has been overdone, so that, with a somewhat prevalent disposition to retrench and curtail, together with a closer scrutiny of mercantile credit, the movement between producer and consumer is characterized by sluggishness rather than activity. Nevertheless there are many cheering indications. As remarked by *Bradstreets'*, referring to the independence of the agricultural classes, and their consequent ability to hold on in expectation of a better day, "On the whole, we anticipate a gradual readjustment of prices in the United States, but no violent disturbance of the credit system, at least not in the near future."

In support of this view the foreign commerce statistics of the week are more favorable, the exports being in good proportions, while the imports of general merchandise were the smallest for any like period since the beginning of the year. Wall street bullion dealers anticipate the probability of a speedy resumption of specie imports, the event depending simply on the offerings of commercial bills, though just at present the high rate of discount by the Bank of England is an impediment perhaps not easily overcome. It is also to be noted, as the week closes, that the foreign grain markets are generally stronger, with an advancing tendency, and the outward movement is limited only by the available amount of ocean tonnage, even at the current high rates of freight. Transactions have been as high as 300,000 bushels per day, for prompt delivery. On the Produce Exchange speculative operations are of an indifferent character, while legitimate trade is on a comparatively moderate scale, and the demand behind the average for the season on both export and home account. Cotton is inclined to drop. The Department of Agriculture expects that the estimated yield of wheat in the country is 510,000,000 bushels, a previous error of 100,000,000 having been accounted for.

Respecting the railroad war, the latest reports to-day afford little prospect of an early closing of hostilities. The Eastward-bound trunk lines from Chicago, however, report a heavy business, and at remunerative rates—this being the first week for many months that the shipments exceeded those of the corresponding period in 1881.

In the money market the past week, which opened with call loans quoted as high as 20 %, a notable change has occurred, the closing rate being 3 @ 4 %. On Friday evening ease suddenly returned, after the following announcement:

WASHINGTON, D. C., Nov. 24, 1882.

Thomas C. Acton, Assistant Treasurer, New York: Accept unmatured bonds in all calls, including 119th, without rebate of interest, at the rate of $10,000,000 per week, on any day of week, payable at your office until otherwise ordered.

CHARLES J. FOLGER, Secretary Treasury.

The relief afforded was more apparent on the publication of the following, the bids for bonds immediately advancing ⅛ @ ¼:

TREASURY DEPARTMENT, Nov. 25, 1882.

Assistant Treasurer United States, New York: In lieu of a call for bonds of the 5 % funded loan of 1881, continued at 3½ %, by highest number at a notice of three months, as required by law, and then, in anticipation of payment without rebate of interest, the Secretary of the Treasury will, on February 28 next, receive and pay $10,000,000 of those bonds which have not been called for payment, without specifying numbers and without regard thereto, if the holders present them for payment, and he will, any time from now to that date, pay that amount of those bonds, without rebate of interest, if they are presented at your office.

CHARLES J. FOLGER, Secretary.

Quotations for commercial paper are nominal and the best names are at 7 to 8 %, without sales. On the Stock Exchange a lull naturally followed the extreme activity of one week ago. The official record shows that Wednesday's transactions reached the unprecedented amount of 834,702 shares, and that the aggregate exchanges for the week ending Saturday exceeded $1,200,000,000, a figure never before approached, with a single exception. For the succeeding two or three days the market was principally influenced by the railroad war, and quotations steadily declined until Saturday, when there was a sharp recovery, accelerated by the decline in the rate for money to 3 %. The Gould specialties were strong throughout, and the Vanderbilt and Villard strong at the close, prices having advanced ½ @ 5⅜ %. On Monday the market was irregular, but active, and closed buoyant, on a reported settlement of railroad difficulties in the Northwest. To-day the improvement was still more manifest, the advance from the lowest prices of the morning bearing ½ @ 6 %. The leading stocks to-day ranged as follows: Denver 41¼ @ 48½, D., L. and W. 123½ @126⅝, Kan. and Texas 30 @ 32⅛, Lake Shore 111⅞ @ 113¾, Louisville 49¼ @ 51¼, Western Union Tel. 80½ @ 82, Union Pacific 101½ @ 104⅛, Texas and Pacific, 35½ @ 38⅛; Milwaukee and St. Paul, 100 @ 104¼; Omaha, 44¾ @ 47¼; Rock Island, 123½ @ 128; Reading, 48½ @ 51⅞; Northwest, 133 @ 137⅛; do. preferred, 150⅞ @ 154; Jersey Central, 65¾ @ 69¼, New York Central 127½ @ 130¼, Missouri Pacific 98¾ @ 102½, Michigan Cent. 95¼ @ 98, Nor. Pacific 43 @ 44¼, do. preferred 93¼ @ 95, Oregon and Transcontinental 81⅞ @ 84, Canada Southern 65 @ 68, and Wabash preferred 51½ @ 54⅞.

Sterling is weak, rates having been reduced to within a fraction of the point which allows gold importations at a profit. The rates posted by some of the leading bankers are 4.80 for 60-day and 4.84 for sight, and the actual rates 4.79 @ 4.79¼ and 4.83 @ 4.83¼, with cables 4.84 @ 4.84 ¼, and prime commercial bills 4.77½ @ 4.77¾.

The annual meeting of the National Board of Trade will be held in Washington Jan. 17.

The importations of specie and bullion at this port during the week ending November 24 were $323,534, consisting of $203,827 in gold and $119,707 in silver, as against a total of $415,263 for the week ending November 26 last year. The importations since the 1st of January compare as follows with the movement during the corresponding period last year:

	Since January 1— 1882.	1881.
Gold	$1,277,620	$51,420,294
Silver	3,516,502	2,623,106
Total	$5,794,122	$54,043,400

The bank return for the week shows a loss of $1,192,525 in reserve, which now stands at $2,071,200 below, against $971,100 above at this time last year, and $105,675 below for the corresponding date in 1880. The movement of the week demonstrates the extent to which funds were locked up for the purpose of causing stringency in the money market, with a view to its effects on stocks.

The following is an analysis of the bank totals for this week, compared with that of last week.

	Nov. 18.	Nov. 25.	Comparisons.
Loans	$314,026,500	$309,208,800	Dec. $4,187,700
Specie	50,985,400	48,245,500	Dec. 2,799,900
Legal t'd'rs	19,284,500	19,165,800	Dec. 118,700
Tot. reserve	70,269,900	67,411,300	Dec. 2,858,600
Deposits	284,594,300	277,930,000	Dec. 6,664,300
Reserve required	71,148,575	69,482,500	Dec. 1,666,075
*Reserve	*878,675	2,071,200	Dec. 1,192,525
Circulation	18,665,700	18,590,700	Dec. 75,000

*Deficiency.

Government bonds have been somewhat irregular, but at the close were firm, at the following quotations:

	Bid.	Asked.
U. S. 6's, '81, continued at 3½	—	—
U. S. 5's, '81, continued at 3½	101½	102
U. S. 4½'s, 1891, registered	111⅞	112⅛
U. S. 4½'s, 1891, coupon	113	113⅛
U. S. 4's, 1907, registered	118⅝	119
U. S. 4's, 1907, coupon	118⅝	119
U. S. 3 per cents	102	102⅛
U. S. Currency 6's, 1895	129	—
U. S. Currency 6's, 1896	130	—
U. S. Currency 6's, 1897	130½	—
U. S. Currency 6's, 1898	131	—
U. S. Currency 6's, 1899	132	—

State bonds more irregular, but to-day Tennessee 6's mixed advanced to 43.

MINING STOCKS.

The following were the closing prices for mining stocks:

	Bid.	Asked.
Amie	10	....
Alice	..	2.15
Alta Mont	12	16
Bechtel	17	....
Bodie	2.50	....
B., H. & E. n	⅝	1¼
Bulwer	1.10	1.25
Big Pittsburgh	10	....
Bradshaw	45	49
Calaveras	1	....
California	9	12
Caled. B. H	1.95	....
Climax	....	2
Consolidated Imperial	3	5
Consolidated Virginia	67	60
Chrysolite	1.00	1.05
Cent. Ariz	50	55
Cherokee	4	....
Dunkin	15	....
Decatur	8	....
F. De Smet	3.50	4.50
Gr. Prize	....	25
Great Eastern	....	3
Green Mountain	29	30
Homestake	....	20
Hukill	....	11
Horn Silver	4.50	....
Hibernia	3	....
Hortense	12	10
Hall Anderson	2.25	2.10
Independence	....	86
Iron Silver	2.50	2.60
Leadville Con	65	....
Little Pitts	55	60
L. Chief	30	....
Navajo	6¾	7⅛
North Standard	12	25
Nor. Belle	9½	....
N. Belle Isle	28	....
Ord. and Mil	12	12¾
Rappahanock	10	12
Robinson Con	1.25	1.30
Rising Sun	4	....
Standard	6⅜	7
S. Cliff	45	....
Sutro Tun	24	25
Spring Valley	2.00	2.50
S. Hite, N	20	....
South Pacific	....	9
St. L. 2 and 3	8	9
Tioga	5	....
Tuscarora	5	6
Union Con	4.75	5.25
Unadilla	4	7
Vizina	....	1.40

GENERAL HARDWARE.

Business continues quiet, but this condition of affairs is not unnatural, considering that we are almost on the eve of the holiday season. In many lines of goods prices are irregular, and the impression prevails that considerable revision of lists and discounts will be made on or before the opening of the new year.

The demand for Nails, although light, shows some improvement over last week. Prices are unchanged, and we continue to quote 10d. to 60d., $3.65, net, per keg.

We have received the following circular:

READING, PA., November, 1882.

DEAR SIR: We take pleasure in informing you that for the convenience of the trade we have established a depot for our goods in Baltimore, with Messrs. Moritz & Keidel, and shall keep a full and complete stock with them, which they will sell at our lowest factory prices. Thanking you for the favors shown us in the past, and trusting by attention to your wants we shall continue to merit a share of your esteemed patronage, we remain, Respectfully yours,

THE PENN HARDWARE CO.

In a recent issue we announced that the manufacturers of Wire Cloth had formed an association to be known as the Wire Cloth Manufacturers' Association, and had adopted a uniform price list and discounts. The committee on business reported in favor of the adoption of the present price list of Howard & Morse, of New York, and on motion it was adopted. We print below the association list, which is subject to the following discounts when ordered in full rolls.

	Net cash.
Locomotive Spark Wire Cloth	45 %
Twilled Spark Wire Cloth	30 %
Heavy Rice Wire Cloth	30 %
Battery Grape Wire Cloth, Nos. 1 to 22 mesh.	35 %
Light Grade Wire Cloth, 17 cent grade and under, No. 1 to No. 20 mesh	45 %
Light Grade Wire Cloth, Nos. 20 to 80 mesh	35 %
Galvanized Wire Cloth Iron List	15 %
Tinned Wire Cloth, Iron List	30 %
Tinned Wire Cloth, Milling	30 %
Bessemer Steel Wire Cloth, same discounts as Iron.	
Plain Painted Wire Cloth, 5 cents	40 %
Figured Painted Wire Cloth, 16 mesh, 10 cents	40 %
Landscape Painted Wire Cloth, 16 mesh, 25 cents	40 %
Heavy Bolting Wire Cloth	25 %
Malt-Kiln Floor Wire Cloth	30 %
Brass Wire Cloth, all numbers to No. 40 inclusive	30 %
To Wire Cloth Trade Only	40 %
All Meshes finer than No. 40 Mesh	20 %
To Wire Cloth Trade Only	30 %
Copper Wire Cloth, Brass Wire Cloth List Price	
To Wire Cloth Trade Only	10 %
Brass Milk Strainer Cloth No. 40	14 cts.
" " " " " 50	16 "
" " " " " 60	25 "

Ten per cent. to the Wire Cloth Trade Only.

No length of Wire Cloth less than 100 feet shall be understood to be a roll. Shorter lengths than full rolls, 12 per cent. less discount than full-roll rates.

THE WIRE CLOTH MANUFACTURERS' ASSOCIATION'S PRICE LIST OF WIRE CLOTH, OCTOBER 26, 1882.

The Standard Gauges are Worcester Gauge for Iron or Steel Wire Cloth, Old English Gauge for Brass or Copper Wire Cloth.

Bessemer Steel Wire Cloth, same Price as Iron Wire Cloth.

Regular Coal Screen Grade of Screen Cloth—No length less than 100 feet shall be understood to be a Roll.

Inch space.		Wire.	Cts. pr. sq. ft.	Inch space.		Wire.	Cts. pr. sq. ft.
2½,	from No.	000	75	1,	from No.	3	64
2¼,	"	00	64	⅞,	"	0	48
2,	"	0	64	⅞,	"	8	48
1¾,	"	0	72	⅞,	"	10	40
1½,	"	1	64	⅞,	"	11	40
1¼,	"	2	64	¼,	"	13	40

Price List of Crimped Spark Wire Cloth.

No.		Wire	Cts. pr. sq. ft.	No.		Wire	Cts. pr. sq. ft.
2 Mesh,	10	Wire	38	5 Mesh,	15	Wire	38
2½ "	11	"	38	6 "	16	"	38
3 "	12	"	38	8 "	18	"	38
3½ "	13	"	38	10 "	19	"	48
4 "	14	"	38	12 "	20	"	48
5x2 "	14	"	35				

Price List of Twilled Spark Wire Cloth.

No.		Wire	Cts. pr. sq. ft.	No.		Wire	Cts. pr. sq. ft.
4 Mesh,	17	Wire	22	8 Mesh,	21	Wire	32
5 "	18	"	22	10 "	23	"	32
6 "	19	"	22	12 "	24	"	32

Price List of Stout Rice Wire Cloth.

Mesh.			Cts. pr sq. ft.
No. 8,	made from	No. 19 Wire	32
" 10,	"	" 21 "	32
" 12,	"	" 22 "	32
" 14,	"	" 23 "	32
" 16,	"	" 24 "	32

Price List of Square Wire Smut Cloth.

Nos. 4 to 10 Mesh, Extra Stout, per sq. ft. $0.75
" 4 to 10 " Steel Wire, Stout per sq. ft. 1.00

Malt-kiln Floors.

Price List of Heavy Rolled Wire Cloth.

No. 6 Mesh made from No. 14 Wire, pr sq. ft. $0.60

Edges prepared for Patent Seam, 68 cents per sq. foot for all the wire cloth consumed.

Price List of Wove Window Guard Wire Cloth.

No. 12x4 Mesh, from No. 17 Wire, per sq. ft. $0.15

Price List of Painted Window Screen Wire Cloth.

Plain Painted Wire Cloth, by the roll, per sq. foot $0.05
Figured Painted Wire Cloth, by the roll, per sq. foot 0.10
Landscape Painted Wire Cloth, by the roll, per sq. foot 0.25

Price List of heavy Grade Mining Wire Cloth.

No.		Wire	Cts. per sq. ft	No.		Wire	Cts. per sq. ft.
4 Mesh,	12	Wire	60	16 "	22	"	60
5 "	13	"	60	18 "	23	"	60
6 "	14	"	60	20 "	24	"	62
7 "	15	"	60	24 "	26	"	65
8 "	16	"	62	30 "	28	"	66
9 "	17	"	60	35 "	30	"	67
10 "	18	"	60	40 "	31	"	68
12 "	19	"	60	45 "	33	"	70
14 "	20	"	60	50 "	34	"	72

Price List of Heavy Grade Bolting Wire Cloth.

No. mesh.		Wire.	Cts. pr sq. ft.	No. mesh.		Wire.	Cts. pr sq. ft.
10,	from No.	20	36	40,	from No.	33	48
12,	"	21	38	45,	"	34	53
14,	"	22	38	50,	"	35	59
16,	"	23	38	55,	"	36	61
18,	"	24	38	60,	"	36	68
20,	"	26	43	64,	"	37	75
24,	"	28	46	70,	"	38	80
30,	"	30	47	74,	"	39	90
25,	"	32	47	80,	"	40	105

Galvanized Wire Cloth.—Same Price List as Plain Iron Wire Cloth.

Price List of Light Grade Bolting Wire Cloth.

No. mesh.		Wire	Cts. pr sq. ft.	No. mesh.		Wire.	Cts. pr sq. ft.
10,	from No.	23	28	30,	from No.	31	37
12,	"	24	32	35,	"	33	40
14,	"	25	32	40,	"	34	44
16,	"	26	32	45,	"	35	48
18,	"	27	32	50,	"	36	52
20,	"	29	34	55,	"	37	56
24,	"	30	30	60,	"	38	60

Price List of Tinned Milling Grade Wire Cloth.

No. mesh.		Wire.	Cts. pr sq. ft.	No. mesh.		Wire.	Cts. pr sq. ft.
10,	from No.	25	14	25,	from No.	32	22
12,	"	26	14	26,	"	33	23
14,	"	27	15	28,	"	34	23
16,	"	28	15	30,	"	34	23
18,	"	29	15	35,	"	35	30
20,	"	30	20	40,	"	30	38
22,	"	31	22				

Tinned Wire Cloth.—Same Price List as Plain Iron Wire Cloth.

Price List of Machinery Grade Iron Wire Cloth.

No. mesh.		Wire.	Cts. pr sq. ft.	No. mesh.		Wire.	Cts. pr sq. ft.
2,	from No.	11	32	8,	from No.	19	32
2½,	"	12	32	10,	"	21	32
3,	"	13	32	12,	"	22	32
3½,	"	14	32	14,	"	23	32
4,	"	15	32	16,	"	24	32
5,	"	16	32	18,	"	25	32
6,	"	17	32	20,	"	27	33

Price List of Heavy Foundry Grade Iron Wire Cloth.

No. mesh.		Wire.	Cts. pr sq. ft.	No. mesh.		Wire.	Cts. pr sq. ft.
2,	from No.	13	27	8,	from No.	20	27
2½,	"	13	27	10,	"	22	27
3,	"	14	27	12,	"	23	27
3½,	"	15	27	14,	"	24	27
4,	"	16	27	16,	"	25	27
5,	"	17	27	18,	"	26	27
6,	"	18	27	20,	"	28	27

Price List of Foundry Grade Iron Wire Cloth.

No. mesh.		Wire.	Cts. pr sq. ft.	No. mesh.		Wire.	Cts. pr sq. ft.
2,	from No.	14	17	8,	from No.	22	17
2½,	"	15	17	10,	"	24	17
3,	"	16	17	12,	"	25	17
3½,	"	17	17	14,	"	26	17
4,	"	18	17	16,	"	27	17
5,	"	19	17	18,	"	28	17
6,	"	20	17	20,	"	31	17

Price List of Riddle Grade Iron Wire Cloth.

No. mesh.		Wire.	Cts. pr sq. ft.	No. mesh.		Wire.	Cts. pr sq. ft.
2,	from No.	16	12	8,	from No.	24	12
2½,	"	17	12	10,	"	26	12
3,	"	18	12	12,	"	27	12
3½,	"	19	12	14,	"	29	12
4,	"	20	12	16,	"	30	12
5,	"	21	12	18,	"	31	12
6,	"	22	12	20,	"	34	12

Price List of Hardware Grade of Iron Wire Cloth.

No. mesh.		Wire.	Cts. pr sq. ft.	No. mesh.		Wire.	Cts. pr sq. ft.
2,	from No.	17	12	8,	from No.	25	10
2½,	"	18	12	10,	"	27	12
3,	"	19	10	12,	"	28	12
3½,	"	20	12	14,	"	31	12
4,	"	21	12	16,	"	32	10
5,	"	22	10	18,	"	33	10
6,	"	23	12	20,	"	35	10

Price List of Light Hardware Grade Iron Cloth.

No. mesh.		Wire.	Cts. pr sq. ft.	No. mesh.		Wire.	Cts. pr sq. ft.
2,	from No.	18	8	8,	from No.	26	8
2½,	"	19	8	10,	"	28	8
3,	"	20	8	12,	"	29	8
3½,	"	21	8	14,	"	33	8
4,	"	22	8	16,	"	34	8
5,	"	23	8	18,	"	35	8
6,	"	24	8	20,	"	36	8

Manufacturers' price list of all Grades of Iron Wire Cloth.

No length less than 100 feet shall be understood to be a roll. The mesh in Wire Cloth is the distance from the center to the center of the wire.

No. mesh.	Wire.	Cts. pr sq. ft.	No. mesh.	Wire.	Cts. pr sq. ft.
1,	from No. 3	88	8,	from No. 27	7
1,	" 4	73	9,	" 17	60
1,	" 5	60	9,	" 18	48
1,	" 6	48	9,	" 19	38
1,	" 7	38	9,	" 20	32
1,	" 8	32	9,	" 21	27
1,	" 9	27	9,	" 22	22
1,	" 10	22	9,	" 23	17
1,	" 11	17	9,	" 24	14
1,	" 12	14	9,	" 25	12
1,	" 13	12	9,	" 26	10
1,	" 14	10	9,	" 27	8
1,	" 15	8	9,	" 28	7
1¼,	" 4	88	10,	" 18	60
1¼,	" 5	73	10,	" 19	48
1¼,	" 6	60	10,	" 20	38
1¼,	" 7	48	10,	" 21	32
1¼,	" 8	38	10,	" 22	27
1¼,	" 9	32	10,	" 23	22
1¼,	" 10	27	10,	" 24	17
1¼,	" 11	22	10,	" 25	14
1¼,	" 12	17	10,	" 26	12
1¼,	" 13	14	10,	" 27	10
1¼,	" 14	12	10,	" 28	8
1¼,	" 15	10	10,	" 29	7
1¼,	" 16	8	12,	" 19	60
1½,	" 5	88	12,	" 20	48
1½,	" 6	73	12,	" 21	38
1½,	" 7	60	12,	" 22	32
1½,	" 8	48	12,	" 23	27
1½,	" 9	38	12,	" 24	22
1½,	" 10	32	12,	" 25	17
1½,	" 11	27	12,	" 26	14
1½,	" 12	22	12,	" 27	12
1½,	" 13	17	12,	" 28	10
1½,	" 14	14	12,	" 29	8
1½,	" 15	12	12,	" 30	7
1½,	" 16	10	14,	" 20	60
1½,	" 17	8	14,	" 21	48
2,	" 8	60	14,	" 22	38
2,	" 9	48	14,	" 23	32
2,	" 10	38	14,	" 24	27
2,	" 11	32	14,	" 25	22
2,	" 12	27	14,	" 26	17
2,	" 13	22	14,	" 27	15
2,	" 14	17	14,	" 28	13
2,	" 15	14	14,	" 29	12
2,	" 16	12	14,	" 30	11
2,	" 17	10	14,	" 31	10
2,	" 18	8	14,	" 32	9
2½,	" 9	60	14,	" 33	8
2½,	" 10	48	14,	" 34	7
2½,	" 11	38	16,	" 22	60
2½,	" 12	32	16,	" 22&23	48
2½,	" 13	27	16,	" 23	38
2½,	" 14	22	16,	" 24	32
2½,	" 15	17	16,	" 25	27
2½,	" 16	14	16,	" 26	22
2½,	" 17	12	16,	" 27	17
2½,	" 18	10	16,	" 28	15
2½,	" 19	8	16,	" 29	13
3,	" 10	60	16,	" 30	12
3,	" 11	48	16,	" 31	11
3,	" 12	38	16,	" 32	10
3,	" 13	32	16,	" 33	9
3,	" 14	27	15,	" 34	8
3,	" 15	22	16,	" 35	7
3,	" 16	17	18,	" 23	60
3,	" 17	14	18,	" 23&24	48
3,	" 18	12	18,	" 24	38
3,	" 19	10	18,	" 25	32
3,	" 20	8	18,	" 26	27
3½,	" 11	60	18,	" 27	22
3½,	" 12	48	18,	" 28	17
3½,	" 13	38	18,	" 29	15
3½,	" 14	32	18,	" 30	13
3½,	" 15	27	18,	" 31	12
3½,	" 16	22	18,	" 32	11
3½,	" 17	17	18,	" 33	10
3½,	" 18	14	18,	" 34	9
3½,	" 19	12	18,	" 35	8
3½,	" 20	10	18,	" 36	7
3½,	" 21	8	20,	" 24	62
4,	" 12	60	20,	" 25	52
4,	" 13	48	20,	" 26	43
4,	" 14	38	20,	" 27	35
4,	" 15	32	20,	" 28	27
4,	" 16	27	20,	" 29	24
4,	" 17	22	20,	" 30	20
4,	" 18	17	20,	" 31	17
4,	" 19	14	20,	" 32	15
4,	" 20	12	20,	" 33	14
4,	" 21	10	20,	" 34	12
4,	" 22	8	20,	" 35	10
4½,	" 13	57	20,	" 36	8
4½,	" 14	45	22,	" 25	65
4½,	" 15	35	22,	" 26	55
4½,	" 16	29	22,	" 27	46
4½,	" 17	24	22,	" 28	38
4½,	" 18	19	22,	" 29	30
4½,	" 19	15	22,	" 30	26
4½,	" 20	13	22,	" 31	22
4½,	" 21	11	22,	" 32	19
4½,	" 22	9	22,	" 33	17
4½,	" 23	7	22,	" 34	15
5,	" 13	60	22,	" 35	13
5,	" 14	48	22,	" 36	12
5,	" 15	38	24,	" 26	65
5,	" 16	32	24,	" 27	55
5,	" 17	27	24,	" 28	46
5,	" 18	22	24,	" 29	38
5,	" 19	17	24,	" 30	30
5,	" 20	14	24,	" 31	26
5,	" 21	12	24,	" 32	22
5,	" 22	10	24,	" 33	19
5,	" 23	8	24,	" 34	17
5,	" 24	7	24,	" 35	15
6,	" 14	60	24,	" 36	13
6,	" 15	48	30,	" 28	66
6,	" 16	38	30,	" 29	56
6,	" 17	32	30,	" 30	47
6,	" 18	27	30,	" 31	37
6,	" 19	22	30,	" 32	31
6,	" 20	17	30,	" 33	27
6,	" 21	14	30,	" 34	23
6,	" 22	12	30,	" 35	20
6,	" 23	10	30,	" 36	10
6,	" 24	8	40,	" 31	68
6,	" 25	7	40,	" 32	57
7,	" 15	60	40,	" 33	48
7,	" 16	48	40,	" 34	44
7,	" 17	38	40,	" 35	40
7,	" 18	32	40,	" 36	36
7,	" 19	27	40,	" 37	32
7,	" 20	22	50,	" 34	72
7,	" 21	17	50,	" 35	59
7,	" 22	14	50,	" 36	52
7,	" 23	12	50,	" 37	48
7,	" 24	10	50,	" 38	44
7,	" 25	8	60,	" 36	68
7,	" 26	7	60,	" 37	64
8,	" 16	60	60,	" 38	60
8,	" 17	48	60,	" 39	58
8,	" 18	38	64,	" 37	75
8,	" 19	32	64,	" 38	70
8,	" 20	27	64,	" 39	65
8,	" 21	22	70,	" 38	80
8,	" 22	17	70,	" 39	75
8,	" 23	14	74,	" 39	90
8,	" 24	12	74,	" 40	85
8,	" 25	10	80,	" 40	$1.05
8,	" 26	8	80,	" 41	90

BRASS AND COPPER WIRE CLOTH.

Price List of Regular Market Grade of Brass and Copper Wire Cloth

No. mesh.	Wire.	Per sq. ft.	No. mesh.	Wire.	Per sq. ft.
2,	from No. 16	$0.50	20,	from No. 28	$0.50
3,	" 17	.50	22,	" 29	.50
4,	" 18	.50	24,	" 30	.50
5,	" 19	.50	30,	" 31	.52
6,	" 20	.50	40,	" 33	.55
8,	" 22	.50	50,	" 35	.58
10,	" 23	.50	60,	" 36	.60
12,	" 24	.50	70,	" 37	.70
14,	" 25	.50	80,	" 38	.90
16,	" 26	.50	90,	" 39	1.10
18,	" 27	.50	100,	" 40	1.30

Price List of Brass Milk Strainer Wire Cloth.

No. 40 Mesh from No. 36 Wire, cts. per sq. ft. ... 14
No. 50 " No. 36 " " " ... 16
No. 60 " No. 37 " " " ... 25

Price List of Twilled Brass or Copper Wire Cloth.

All Meshes 10 cents per square foot advanced on price of plain Cloth.

Price List of Brass Wire Cloth for Sugar Mills.

	Per sq. ft.
No. 120 Mesh, German, wove to size Nos. 27 and 33 Wire	$1.00
No. — Mesh, Heavy Twilled Backing	.70
No. 16 " Regular Plain "	.50

Manufacturers' Price List of all Grades of Brass and Copper Wire Cloth. The Mesh in Wire Cloth is the distance from the Center to the Center of the Wire.

No. mesh.	Wire	Per sq. ft.	No. mesh.	Wire.	Per sq. ft.
2,	from No. 10	$2.50	14,	from No. 23	.80
2,	" 11	2.00	14,	" 24	.60
2,	" 12	1.50	14,	" 25	.50
2,	" 13	1.10	14,	" 26	.45
2,	" 14	.80	14,	" 27	.40
2,	" 15	.60	14,	" 28	.35
2,	" 16	.50	16,	" 24	.80
3,	" 11	2.50	16,	" 25	.60
3,	" 12	2.00	16,	" 26	.50
3,	" 13	1.50	16,	" 27	.45
3,	" 14	1.10	16,	" 28	.40
3,	" 15	.80	16,	" 29	.35
3,	" 16	.60	16,	" 30	.30
3,	" 17	.50	18,	" 25	.80
3,	" 18	.45	18,	" 26	.60
4,	" 12	2.50	18,	" 27	.50
4,	" 13	2.00	18,	" 28	.45
4,	" 14	1.50	18,	" 29	.40
4,	" 15	1.10	18,	" 30	.35
4,	" 16	.80	18,	" 31	.30
4,	" 17	.60	20,	" 26	.80
4,	" 18	.50	20,	" 27	.60
4,	" 19	.45	20,	" 28	.50
5,	" 13	2.50	20,	" 29	.45
5,	" 14	2.00	20,	" 30	.40
5,	" 15	1.50	20,	" 31	.35
5,	" 16	1.10	20,	" 32	.30
5,	" 17	.80	20,	" 33	.27
5,	" 18	.60	20,	" 34	.25
5,	" 19	.50	22,	" 27	.80
5,	" 20	.45	22,	" 28	.60
6,	" 14	2.50	22,	" 29	.50
6,	" 15	2.00	22,	" 30	.45
6,	" 16	1.50	22,	" 31	.40
6,	" 17	1.10	22,	" 32	.35
6,	" 18	.80	22,	" 33	.30
6,	" 19	.60	22,	" 34	.27
6,	" 20	.50	24,	" 28	.80
6,	" 21	.45	24,	" 29	.60
8,	" 16	2.50	24,	" 30	.50
8,	" 17	2.00	24,	" 31	.45
8,	" 18	1.50	24,	" 32	.40
8,	" 19	1.10	24,	" 33	.35
8,	" 20	.80	24,	" 34	.30
8,	" 21	.60	24,	" 35	.27
8,	" 22	.50	30,	" 30	.65
8,	" 23	.45	30,	" 31	.52
8,	" 24	.40	30,	" 32	.47
10,	" 18	2.00	30,	" 33	.42
10,	" 19	1.50	30,	" 34	.37
10,	" 20	1.10	30,	" 35	.33
10,	" 21	.80	30,	" 36	.30
10,	" 22	.60	40,	" 32	.70
10,	" 23	.50	40,	" 33	.55
10,	" 24	.45	40,	" 34	.48
10,	" 25	.40	50,	" 34	.75
12,	" 19	2.00	50,	" 35	.58
12,	" 20	1.50	50,	" 36	.50
12,	" 21	1.10	60,	" 35	.78
12,	" 22	.80	60,	" 36	.60
12,	" 23	.60	60,	" 37	.52
12,	" 24	.50	70,	" 37	.70
12,	" 25	.45	80,	" 38	.90
12,	" 26	.40	90,	" 39	1.10
14,	" 22	1.10	100,	" 40	1.30

Price List of Extra Fine Brass Wire Cloth.

No.	Per sq. ft	No.	Per sq. ft.
110 Mesh, Plain	$1.35	150 Mesh, Twilled	3.00
120 " "	1.60	100 " "	3.60
130 " "	1.90	170 " "	4.20
110 " Twilled	1.45	180 " "	4.80
120 " "	1.70	190 " "	5.40
130 " "	2.00	200 " "	6.00
140 " "	2.45		

In the advertisement of W. S. Johnston, trustee, which has appeared for some time among Special Notices, the date of the foreclosure sale of the Poughkeepsie Iron and Steel Co. was stated incorrectly Tuesday, December 9th, instead of Saturday, December 9th. We invite attention to the advertisement referred to.

E. Bissell & Co. announce in an advertisement that appears among Special Notices, an Auction Sale of Table Cutlery, Tea and Table Spoons and Kindred Goods, to be held at their salesrooms, Nos. 83 Chambers and 65 Reade street, on Wednesday, December 6th, at 10 a. m., and on Tuesday, December 12th, by order of a large manufacturer, a Special Sale of Fine Plated Ware. Further particulars will be found in the advertisement referred to.

IRON.

American Pig.—There is very little business transpiring in any branch of the Iron trade, although deliveries on old contracts are said to be large. During the week under review no sales of importance have been announced. Prices are more in buyers' favor than at the time of our last writing. We quote: Foundry No. 1 X, $25 @ $26; Foundry No. 2 X, $23 @ $24; Gray Forge, $20 @ $21.

Steel Rails.—No new business is reported, but we hear of considerable inquiry, stimulated, no doubt, by the low prices prevailing. We quote Steel Rails at mill, ordinary sections, $40.

Old Rails.—This branch of the Iron trade is sadly neglected, and the tone of the market is drooping and favors the buying interest. We quote T's, $27, and D. H., $29.

Scotch Pig.—The tone of the market is downward, although, owing to the fact that there is very little Iron on the spot, pick-up lots command much fuller figures than parcels to arrive. Sales during the week would aggregate, of various brands, about 700 tons. We quote: Eglinton, $22 @ $23; Carnbroe and Glengarnock, $23 @ $24; Coltness, $26.50 @ $27; Gartsherrie, $26, and Langloan, $26.50.

Wrought Scrap.—A few sales of small lots from yard are reported at $27 ₩ ton. Some holders ask $28, but it would be difficult to realize this figure unless the lot was extra choice.

METALS.

Copper.—Copper is in good position on this side, so far as the metal itself is concerned, but it is rendered flat, in common with other metals and commodities in general, by the mixed-up condition of the local financial status and its doubtful immediate future. Sales for the week have been confined to some 150,000 lbs. Lake at 18¢ @ 18¼¢, which is the closing figure, while Arizona and Baltimore are worth 17½¢ @ 17⅝¢. London cabled yesterday, £74. 10/, Best Selected, and £67. 10/, Chili Bars. This afternoon we are cabled from there direct as under: "Market quiet and steady, with fair business doing. Best Selected, £74 @ £75; Chili Bars, £66.15/ @ £67.5/." Our mail advices read as follows: "London, November 11.—This market has been rather variable, but a fair business has been done in Chili Bars at fluctuating prices. With regard to general business, the trade must be reported dull, there being a marked scarcity of orders for shipment. Prices for Manufactured are, in consequence, somewhat easy, the prevailing quotations being quite nominal. Notwithstanding the limited purchases that have recently been made for India, and the unfavorable comparisons the exports show with those for the corresponding time of last year, yet at present there seems to be but few, if any, symptoms of any revival, and although it is thought that these limited exports must soon create an increased shipping demand, yet at present there are no signs of any extraordinary demand." Manufacturers have made no change in prices. They quote: Bottoms, 31¢ @ 32¢; Braziers', 30¢ @ 36¢; Circles, 33¢ @ 36¢; Sheathing, 28¢, and Bolt Copper, 30¢; Segment Sheets, 33¢; Fire-box ditto, 30¢.

Tin.—Our market has been moderately active, the quotation for large lines Straits being 22¾¢; Lamb and Flag we quote 23¾¢. The Netherland Trading Company will sell on the 30th inst., at Amsterdam, at auction, 22,800 slabs Banca. This company is just about getting its charter renewed at an abatement in the commission it charges the Government. London cables this morning, Straits Tin £100, with a moderate demand. We receive ourselves from there this afternoon the ensuing dispatch: "Market quiet, with fair demand; quotations higher and futher advance probable. Straits Tin, spot, £99 @ £99.15/; futures, £100 @ £100.15/." By mail we are informed to the following effect: "London, Nov. 11.—Numerous changes have to be reported from day to day in this market, and the turnover has continued extremely heavy, sometimes at falling prices, and at others when they have a strong upward course. Opening dull and with a good deal of disposition to press sales; the market fell away considerably on Monday, but has since recovered, although in effecting this improvement some very sharp movements have accompanied it, and the market has been very disorganized and irregular, so much so as to render it impossible to place any faith in the stability of the market." *Tin Plates.*—Our market has continued quiet and weak, prices easing off gradually. We quote at the close, large lots, ordinary brands, ₩ box: Charcoal Bright, $6 @ $6.25; ditto Ternes, $5.20@$5.37½; Coke Tin, $4.95 @ $5.20, and ditto Ternes, $4.87½ @ $5. England has latterly been in a bad way, Coke being sold from hands at 15/, while Charcoal sells at Liverpool at 18/ @ 20/. We are told per cable from London: "Market continues dull and prices weak."

Lead.—The course of the market has continued downward, between 1000 and 1200 tons selling during the week from 4¾¢ down to 4⅝¢. Offers have since been solicited of 4½¢. We quote the market nominally 4⅝¢, although 4½¢ may be accepted any day. Of *Refined* 200 tons sold at between $4.65 and $4.70. St. Louis is weak and dull at $4.30 for hard and $4.35 for soft. To date from the 1st proximo, the freight thence to New York will be 42¢. By mail, Nov. 11, London reports: "Lead has slightly improved, Spanish being quoted at £13. 12/6 @ £13. 15/, and English at £14. @ £14. 2/6 ₩ ton." Per cable we receive from there the ensuing message this afternoon: "Market quiet and prices lower. Common English Pig, £13. 15/ @ £14." There is no change in manufactures. We quote: Pipe, 7½¢; Sheet, 8¢; Tin-lined Pipe, 15¢, and Block, 45¢, all less 10 % to the trade.

Spelter and Zinc.—There is an apprehension that, while the Iron demoralization lasts, the activity in Barbed Fence Wire may abate notably, which would affect Spelter materially on this side, since Wire galvanizing has of late been its mainstay. This prospect, together with the liberal import so far this year, intensifies the weak feeling noticeable in the domestic product, foreign meanwhile being sustained by the firm feeling in Europe. It is now, however, tolerably certain that importation will receive a check, so that after a while the metal will very likely right itself, the more so since, at the ruling figure for Domestic, the smelter loses money. Between a curtailed domestic output and a lessened importation, the metal would thus possibly recover a reasonable level, even under a less active demand. Hardly anything has transpired during the week, and this at 4¾¢ @ 4⅞¢ for Domestic, while Silesian is firmly held at 5⅜¢ @ 5½¢, being limited from the other side. We quote Bertha Refined, 8¼¢, and Bergenport, 9½¢. From London we receive this afternoon this cablegram: "Market steady, with good business doing. Ordinary at shipping ports, £16. 15/ @ £17." *Sheet Zinc* is quiet at 6¾¢.

Antimony.—A moderate demand prevails at 10⅞¢ for Hallett, and 12¾¢ @ 13¢ for Cookson.

FOREIGN TRADE MOVEMENTS.

The following is a summary of foreign trade movements during the past week:

IMPORTS.

For the week ended November 24:

	1880.	1881.	1882.
Total	$5,063,473	$7,484,000	$7,541,880
Prev. reported	432,319,152	391,708,212	445,598,317
Since Jan. 1	$438,282,625	$399,192,212	$453,140,197

Included in the imports were articles of merchandise valued as follows:

	Quantity.	Value.
Anvils	150	$1,421
Brass goods	57	6,053
Bronze	17	3,117
Chains and anchors	45	1,777
Clocks	69	10,600
Copper	..	329
Cutlery	141	60,233
Guns	197	29,840
Hardware	13	899
Iron, hoop, tons	73	2,893
Iron, pig, tons	5,140	81,955
Iron, sheet, tons	172	8,885
Iron ore, tons	3,080	8,731
Iron, other, tons	1,392	56,105
Railroad bars	42	334
Machinery	260	17,920
Metal goods	836	26,151
Nails	20	1,007
Needles	27	10,626
Nickel	19	6,615
Old metal	..	4,851
Platina	1	21
Platedware	2	187
Percussion caps	30	6,217
Pins	4	211
Quicksilver	300	8,550
Saddlery	20	2,580
Steel	48,340	187,869
Steel blooms	2,251	16,075
Spelter, lbs	454,968	17,966
Silverware	6	191
Tin, boxes	24,226	122,633
Tin, 1140 slabs, lbs	50	482
Wire	58	4,572
Zinc	13,877	601

EXPORTS OF SPECIE.

For the week ended November 25:

Total	$368,661
Previously reported	44,705,471
Total since January 1, 1882	$45,074,132
Same time in 1881	10,426,489
Same time in 1880	7,383,560
Same time in 1879	13,827,861
Same time in 1878	11,726,902
Same time in 1877	24,521,678
Same time in 1876	42,557,323
Same time in 1875	69,450,102
Same time in 1874	50,084,201
Same time in 1873	46,612,696
Same time in 1872	67,561,750

As reported by the Custom House, the imports of leading articles compare with previous dates as follows:

	For the week.	47 weeks of 1882.	Same time 1881.
Cutlery, pkgs	...	6,572	6,227
Hardware, pkgs	197	1,115	893
Iron, R. R., bars	42	92,966	346,625
Lead, pigs	...	30,461	38,836
Steel, pkgs	48,340	1,786,717	1,070,645
Tin, bxs	24,226	1,099,504	1,464,683
Tin slabs, lbs	1,140	19,112,979	16,237,786

IMPORTS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending November 28, 1882.

Hardware.

Boker, Hermann & Co.
Guns, cutlery and hdw., pkgs., 64
Degrauw, Aymar & Co.,
Mdse., cs., 4
Drexel, Morgan & Co.
Arms, cs., 18
Dreyfuss, Weiller & Co.
Packages, 28
Field Alfred & Co.
Mdse., pkgs., 11
Godfrey C. F.
Mdse., cs., 2
Arms, cs., 9
Graham & Haines,
Cases, 4
Maltby, Curtis & Co.
Arms, case, 1
Moore's Sons J. P.
Arms, cs., 28
Merchant Dis. Co.
Arms, cs., 23
Runk & Unger,
Machinery, cse., 1
Schoverling, Daly & Gales,
Arms, cs., 17
Gun barrels, cs., 16
Speiman & Co.
Ironware, cks., 25
Straus, A. D. & Co.
Nails, pkgs., 5
The Barbour Bros. Co.
Machinery, bxs., 5
Winchester Rep. Arms Co.
Mdse., cs., 4
Wiebusch, Hilger & Co.
Hdw. and Cutlery, pkgs., 18
Witte, John G. & Bro.
Cutlery, cs., 8
Order,
Buckets, bdls., 204
Shovels, bdls., 68
Shovels, cks., 1
Chains, cks., 6
Cutlery, cs., 8
Cases, 2
Nails, cks., 30.
Machinery, pkgs., 11

Iron.

Abbott Jere & Co.
Coils, 36
Wire rods, coils, 74
Baring Bros. & Co.
Wire rods, coils., 997
Nail rods, coils., 5032
Bars, 4161
Pig, lot, 1
Brown Bros. & Co.
Bundles, 1475
Brown Vernon H. & Co.
Pig, lot, 1
Bars, 16,239
Bond, Parsons & Co.
Pig, tons, 100
Carey & Moen,
Wire rods, bdls., 850
Duval H. R.
Bars, 3047
Bundles, 989
Dickerson, Van Dusen & Co.
Sheets, bdls., 680
Jackson, H. C.
Wirework, pkge., 1
Leaycroft & Co.
Rolls, 2
Barrel, 1
Lee James & Co.
Pig, tons, 300
Lundberg Gust.
Bars, 7692
Bundles, 1691
Boxes, 2244
Morton, Bliss & Co.
Beams, 100
Perkins & Choate,
Pig, cs., 500
Pierson & Co.
Bars, 68
Order,
Pig, casks, 76
Pig, tons, 4600
Pig, kg., 50,000
Wire rods, coils., 3708
Sheet, bdls., 1000
Ore, tons, 4111
Bands, 400
Bundles, 31
Hoop iron, bdls., 7204
Old wrought, tons, 15½
Old cast, tons, 2
Wire, bdl., 1
Rails, 1059
Wrought beams, 72
Rods, pkgs., 15,745

Steel.

Brown, Wm.
Packages, 183
Carey & Moen,
Wire, bdls., 561
Hoffman & Mayer,
Wire, bdls., 20
Wagner W. F.
Bundles, 215
Bars, 48
Cases, 9
Plates, 23
Wood, Niebuhr & Co.
Wire, pkgs., 160
Order,
Wire, pkgs., 615
Rods, pkgs., 3669
Files, cks., 6
Bundles, 3821
Cask, 1
Bars, 351
Packages, 102

Metals.

Conover —,
Copper, pkgs., 5
Drexel, Morgan & Co.
Plumbago, bbls., 291
Elwell J. W. & Co.
Copper, cks., 2
Metal, bbls., 5
Brass, &c., cks., 3
Ketchum E. & Co.
Tin plts., bxs., 142
Lamarshe H. & Sons,
Zinc, cs., 35
Montell F. T. & Sons,
Old brass, cask, 1
Old brass, bbls., 4
Old copper, cask, 1
Old copper, bbls., 2
Zinc, bbls., 2
Rubirn & Co.
Brass tubes, case, 1
Order,
Tin plts., bxs., 2137
Gas tubes, bdls., 136
Antimony, cks., 133
Old metal, cks., 17
Tin, slabs, 2935
Zinc oxide, bbls., 150
Lead, cks., 23
Lead, pigs, 11
Zinc, pkgs., 368
Zinc, plates, 1900
Zinc, cks., 13
Zinc, bags, 24
Zinc, bbls., 22
Spelter, plts., 21,835

EXPORTS.

In consequence of our publishing day being earlier than usual this week, we are compelled to omit the usual list of exports, both as to merchandise and specie.

COAL.

In the Anthracite Coal trade the past week has been uneventful. The large companies are busy filling old orders, and, in addition, find there is a fair demand for all sizes. With some there is perhaps less demand for Egg; others have no difficulty in disposing of all they can spare. The Pennsylvania Coal Company's sales are all at the November circular prices, which are the same as for the previous month. Of Lehigh Coals it is remarked: "Can't say that prices are particularly firm." Inquiry on all sides fails to disclose any effects attributable to the rumored Iron troubles, which are generally attributed to some sinister motive and without reason. On this point a Pennsylvania Coal reporter says: "The much-bruited depression in the Iron trade is as yet imperceptible in its effects, as Anthracite-consuming furnaces are in full blast, and are wanting their usual supplies of Lump and Steamboat." To the same effect is the remark of a Pottsville paper, viz.: "The reported dullness in the Iron trade has had no effect upon the demand for the furnace sizes; but this is not surprising when it is known that there has been no shutting-down of Anthracite furnaces."

Excepting the embarrassment arising from the scarcity of vessels at shipping ports, trade is progressing quietly, with the prospect that the total product of the year will be about half a million tons in excess of last year's output, which was not far from $28,500,000.

Bituminous Coal is scarce in this market, and is quoted $4.50 @ $5, on board. There is much complaint of a scarcity of cars.

Freights are up around the Cape, and are low this side. To Boston the rate is $1.50; to Providence, 90 cents.

The total tonnage of Anthracite Coal from all the regions for the week ending Nov. 18, as reported by the several carrying companies, amounted to 698,148 tons, against 669,780 tons in the corresponding week last year. The total amount of Anthracite mined for the year is 25,600,813 tons, against 24,688,949 tons for the same period last year.

OLD METALS, PAPER STOCK, &c.

The purchasing prices offered by dealers are as follows:

Copper, heavy	₩ lb.	$ ...	@	$0.15
" light	"	...	@	.13½
Copper Bottoms	"	.13	@	.13½
Yellow Metal	"	.09	@	.09½
Brass, heavy	"	.10	@	.10½
Brass, light	"	.09½	@	...
Composition, heavy	"	.15	@	...
Lead, heavy	"	.04	@	.04¼
Tea Lead	"	.03¾	@	...
Zinc	"	.03¼	@	3½
Pewter, No. 1	"	.14	@	.15
Pewter, No. 2	"	.10	@	...
Wrought Iron	₩ ton.	24.00	@	25.00
Light "	"	12.00	@	13.00
Stove Plate	"	12.00	@	13.00
Machinery do	"	.....	@	15.00
Grate Bars	"	5.00	@	.....
Electrotype plates	₩ lb.	.04¼	@	.....
Stereotype Plates	"	.05½	@	.....
Small type	"	.06	@	.06¼

The prices current (prices paid by local dealers) for Rags, &c., are as follows:

Canvas, Linen	₩ lb.	3½c.	@	4 c.
White Cotton, New	"	3½c.	@	.....
" No. 2	"	2¼c.	@	2½c.
White, No. 1	"	4 c.	@	4½c.
" No. 1	"	2 c.	@	2¼c.
Seconds	"	1 c.	@	1¼c.
Soft Woolens	"	6 c.	@	7 c.
Mixed Rags	"	1¾c.	@	2 c.
Gunny Bagging	"	1½c.	@	.....
Jute Butts	"	1¾c.	@	2 c.
Kentucky Bagging	"	c.	@	3½c.
Book Stock	"	2 c.	@	2½c.
Newspapers	"	1 c.	@	1¼c.
Waste Paper and Scraps	"	½c.	@	¾c.
Kentucky Bale Rope	"	3½c.	@	4 c.

PHILADELPHIA.

Office of *The Iron Age*, 220 South Fourth st., PHILADELPHIA, Nov. 27th, 1882.

Pig Iron.—The market is very much depressed, and prices are weak and irregular. It is almost impossible to get bids unless parties are in immediate need of supplies, as the feeling has become very general that prices are likely to be still lower. Business has been done at an average decline of about 50¢ per ton, although some of the leading brands are firmly held at former quotations. The outlook seems to be shrouded in obscurity as much as at any time during the whole year, although, as already stated, the general feeling at the moment is decidedly weak and "bearish." How far this may have any actual influence remains to be seen. Producers of Pig Iron intimate that their margin is already at the narrowest limits possible, and that a further decline in prices must be followed by a corresponding reduction in fuel, labor and transportation, or a blowing out of furnaces. The scarcity of stock enables sellers to resist a decline more vigorously than usual, but the surrounding influences are of a discouraging character, so that the chances are that prices will have to be lowered before buyers come in with any degree of confidence. Besides, the silly reports which have been circulated in regard to the Iron trade through the daily papers, the decline in stocks and railway securities, has had a depressing effect, and there is a general disposition to hold off until the financial outlook becomes more clearly defined. Apart from the influences which have already been referred to, the position seems to be quite as good as it was a year ago, and if nothing unforeseen occurs, a fairly steady business may be looked for. At the same time the near approach of the holidays, and a natural desire to clean up preparatory to stock-taking, will have a tendency to restrict business until after the turn of the year, so that in the meantime the position will be a very sensitive one. It is to be hoped, therefore, that the money market will become settled and easier, and if things are permitted to fall into their ordinary routine, there is noreason to fear anything worse than a slight falling off in values. A few days of such sensational reports as the trade was subjected to last week may work serious injury to business, but it is probable that matters will now settle themselves naturally, without further outside interference. On such a market as we are now having, it is difficult to give quotations with any degree of exactness. Several of the leading brands remain at same figures as quoted all summer, and without any immediate probability of being changed. There are others, however, which are from 50¢ to $1 lower, and weak at that. In fact, the price depends altogether upon the special requirements of the purchaser. Some brands, as we have said, are weak and lower; others are scarce and firm. Still there is a general tendency toward lower prices, but stocks are not so heavy that buyers can select their own brands at reduced figures. Such as are for sale for immediate delivery are easier to buy, and range at prices varying from $24 to $25 at furnace for No. 1 Foundry, $22 @ $22.50 for No. 2, and $20 @ $21 for Gray Forge, with possible concessions even on these figures to heavy buyers. Choice brands of No. 1 Foundry are held at $25.50 @ $26 at furnace, No. 2 at $23, and Gray Forge $21.50 @ 22, with light supplies and brisk demand.

Foreign Iron.—Bessemer Pig has been neglected for some time past, but it is believed that negotiations now in progress will result in some heavy transactions. Sellers ask $23.50 for spring shipments.

Blooms.—The demand has been somewhat below the average and the feeling is weaker. We give the following quotations: Charcoal Blooms, $66 @ $69; Run-out Anthracite, about $58; Scrap Blooms, $49 @ 51; Northern Ore Blooms, $47.50.

Muck Bars are inclined to be weak, under slow demand; $41 appears to be the outside figure, with lower quotations according to brand and location of mill.

Bar Iron.—The market is somewhat irregular, although there has been a good deal of inquiry within the past two or three days, upon which manufacturers are inclined to

base expectations of more active demand in the near future. So far as actual sales are concerned, the market is exceedingly dull, and it is hardly likely that there will be much improvement until after the opening of the new year. A majority of the mills have orders on hand sufficient to employ them all next month; but, as might be expected, there is sharp competition for new business, so that prices are somewhat irregular. Best Refined Iron of guaranteed quality is held with a good deal of firmness at 2.5¢, but other descriptions are in large supply at prices varying from 2.3¢ to 2.4¢. Skelp Iron is in fair demand, and has been sold at 2.5¢, at which the market may be called steady.

Plate and Tank Iron.—The market has been very dull during the past week and scarcely any new business has come to the surface. This may be due in some measure to the newspaper scare, although there is an evident falling off in consumption, particularly in Tank Iron. There have been several inquiries from the shipyards during the week, and it is expected that orders will follow, but to what extent is not fully known. On the whole, the market is easier than it was, and prices may be quoted as follows: Tank Iron, 2.75¢ @ 2.85¢; Shell Iron, 3.6¢ @ 3.8¢; Flange, 4.75¢ @ 5¢, and Fire-box, 5.75¢ @ 6¢.

Structural Iron.—The feeling is rather weak, and in some articles very low prices have been quoted during the past few days. The amount of work coming forward has been rather disappointing of late, and, although the mills have considerable work on hand, spread over the winter, there is room to fill in a good deal of business between times. Prices are hard to quote with exactness, but 2.75¢ @ 2.85¢ for Angles and 3.75¢ @ 4¢ for Tees appear to be the asking rates, and 4¢ for Beams, and 4.2¢ for Channels.

Sheet Iron.—The demand shows a perceptible falling off, and the mills are now engaged chiefly in finishing off their old contracts. Prices would doubtless be shaded to buyers of large lots, but in a retail way the following are fair average quotations, viz.:

Common Sheets, No. 28	5 ¢
Common Sheets, No. 26 and 27	4.75¢
Common Sheets, No. 22 to 25	4½¢
Common Sheets, No. 16 to 21	4¼¢
Best Refined ¼ ¢ advance on the above	
Best Bloom Sheets, No. 26 to 28	7 ¢
Best Bloom Sheets, No. 22 to 25	6¾¢
Best Bloom Sheets, No. 16 to 21	6½¢
Common Red Plates, 3-16 to 16	3.6¢
Blue Annealed, 3-16 to 16	3.8¢
Best Bloom, Galvanized, discount	35 %
Second quality, discount	45 %

Wrought Iron Pipe.—The market is still very weak and discounts on small lots may be quoted 50 @ 55 per cent. off on Boiler Tubes and 60 @ 65 per cent. on Gas and Steam Pipe, with extra discounts on very desirable orders.

Steel Rails.—A good deal of attention has been attracted to this interest during the past week or two, and there is no doubt that competition for business has been unusually close. Buyers have been attracted by the low prices, and in addition to the sales quoted a week ago an order for 25,000 tons has been closed at $40 by the Bethlehem Iron Co., in addition to which there is a probability of more than 100,000 tons additional being taken by other mills on similar terms. The outlook seems to indicate low prices, but there is no serious scarcity of business at present.

Old Rails.—The market appears to be entirely nominal. There are no spot lots, and very little demand.

Scrap Iron—Is quiet and weak. Buyers are careful in their selections. Quotations are about as follows: Selected No. 1 Wrought, $28.50 @ $29; average Wrought, $27 @ $28; Cast, about $19.50.

PITTSBURGH.

Office of *The Iron Age*, 77 Fourth Avenue, }
PITTSBURGH, PA., November 27, 1882. }

There has been a fair degree of activity in the general Iron trade the past week. As stated in our last report, the hand-to-mouth policy is being generally adhered to, but the mills are all employed and likely to have all they can do until the close of the year. There was no ground for the sensational reports given currency to by the daily papers in regard to the probability of the bottom dropping out of the Iron business. While it is true that the Iron business is not coming up to the expectations of the more sanguine, it is also true that the general Iron business of the West never was in a more healthy condition than at present.

Pig Iron.—The market continues quiet, although business is all that can be expected under existing circumstances and surroundings. Consumers generally are pretty well stocked for present use; some claim to have enough to last them until the close of the year; hence the demand is light and prices weak, but unchanged. We can report sales, mostly in small lots, at $20.50, 4 mos., for White and Mottled; $21.50 @ $22, 4 mos., for Neutral; and $23 @ $23.50 for all-ore Forge. We are cognizant of an offer to buy a line for next year of good Neutral Forge at $21, 4 mos. or $20.50, cash, which was declined. Foundry grades, $22.50 @ $25, 4 mos., according to quality. Bessemer Iron is still quoted at $25 @ $26, 4 mos. Sales of Cold-blast Charcoal at prices ranging from $34 to $39.

Muck Bar—Is dull and weak, and in the absence of sales we reduce quotations to $39, cash, and $40, 4 mos. Large buyers quote at $38, but a good quality of Neutral could hardly be had under our quotations. Mills generally are now able to make about all they require; hence there is not much call for it.

Manufactured Iron.—There has been no important change in the situation since our last report; the mills are all in operation, and, while some of them have orders booked sufficient to absorb their entire production until the close of the year, there are others less fortunate, but it is believed that by the time the latter work up what orders they have on hand that they will have no difficulty in getting new ones enough to keep them going. Business usually slacks up at this particular time, and but for prices, which are weak and irregular, there would be no particular cause for complaint. There is nothing at all unusual in the condition of the market; business is about all that can be expected at this particular time, and the outlook is regarded as being favorable for a good trade early next year. Merchant bars quoted at 2.20¢ @ 2.25¢ rates, 60 days, 20 per cent. off for cash—that is, for desirable orders. For small local orders card rates are still being exacted.

Nails.—Business keeps up well; there are still a good many small orders coming forward, and these, in connection with those already booked, will keep the factories busy for some time, possibly until the close of the year. The Nail trade has been better this fall than for a number of years, and the prospect is very encouraging for a good Spring trade, as the year will close with very light stocks, both in first and second hands. Prices steady at full-card rates; $3.40, 60 days, 2 % off for cash, and the usual abatement of 10 cents ℔ keg on carload lots and upward.

Wrought Iron Pipe.—The demand is just fair; the mills still have all they can do, but new orders are not coming forward so freely. Small sizes are much more inquired for than the larger ones. Discounts on Gas and Steam Pipe remain unchanged at 62½ @ 65 %; Boiler Tubes, 52½ @ 55 % off.

Old Rails.—No sales reported here during the past week; consumers are pretty well stocked and are out of the market. In the absence of sales, we quote American Tees at $29.50 @ $30; and foreign Double Heads at $32.50 @ $33.

Steel Rails.—Here, as elsewhere, the market is somewhat demoralized, and as there have been no sales reported we omit quotations. That the demand is light is owing in part to an expectation on the part buyers of lower prices.

Scrap.—Trade continues quiet, but prices, in the main, are steady. Dealers do not look for any particular activity until January, although there may possibly be a slight improvement next month. No. 1 Wrought Scrap is quotable at from $29 to $30 ℔ net ton; Wrought Turnings, $21 @ $22; Old Car Axles, $38 @ $39; Crop Ends, $27 @ $27.50, gross ton; Old Car Wheels, last sale reported at $27; Cast Borings, $15 @ $16.

Railway Track Supplies.—Railway Spikes unchanged, viz.: 3¢, 30 days; Splice Bars, 2.50¢: Track Bolts, 3.75¢, with square and 3.90¢ @ 4¢ with hexagon nuts.

Coke.—There is no apparent abatement in the demand, and, but for lack of transportation, the shipments would be much larger than they are. Prices remain unchanged at $1.35 ℔ ton on cars at ovens in a regular way, and $1.50 @ $1.60 for small foundry orders.

Window Glass.—There is a good trade for the season; manufacturers have about all they can do; no change in prices.

Petroleum—Continues irregular, and excited speculation is wild, and a great deal of money is being lost and made.

CHATTANOOGA.

Office of *The Iron Age*, Market and 8th Sts., }
CHATTANOOGA, Nov. 27, 1882. }

General trade in the South is fairly active, and prices of all heavy articles are steady, except Steel Rails. The building trades are especially brisk, and all sorts of building material are high. The weather is very favorable for outdoor operations, and the continuance of this weather promises to reach far into the winter season. Cotton is going forward in large quantities in spite of the low price of the staple, and much money is thereby being put in circulation.

Pig Iron.—The Pig Iron market continues in about the same condition as at our last report. The greater part of the Pig now moving goes to fill contracts made late in the summer or early in the fall, and, of course, is at quoted prices. Small lots are also sold at quotations. We quote: No. 1 Foundry, $24 @ $25; No. 2 Foundry, $22 @ $23; Gray Forge, $20 @ $21; White and Mottled, $19 @ $20; Car-wheel Metal, $33 @ $37.

Ores.—We quote: 50 % Brown Hematite, ℔ ton, $2 @ $2.75; Red Fosil, $2 @ $2.25, delivered at furnace.

Miscellaneous Articles.—Old Rails are fairly steady at $25. Scraps are dull. We quote: Wrought at $23; Cast Scrap, $13 @ $15; Old Wheels, $28 @ $29.

Nails.—We quote Nails strong at $3.40 at mills, 60 days; carload lots, 2 % off for cash. The supply is light, and the prospect of a fine winter trade could not be better.

Manufactured Iron.—Bar has a fair market, but the bulk of that being handled is on old orders at about $2.50. Concessions would have to be made on this rate to sell any considerable amount: Railroad Spikes, $3.25; Track Bolts, $4; Fish Plate, $3.

Coal.—We quote: Fancy Lump, $4.50; Common, $3.50 @ $4; run of mine to manufacturers, $2.

Coke.—We quote: Furnace Coke, $3 at point of consumption; Foundry, 10¢ @ 12¢ ℔ bushel.

Steel and Iron Rails.—We quote: Steel Bars nominal at $45; Iron, $45; Small T's, $48 @ $50.

CINCINNATI.

NOVEMBER 27. *Pig Iron.*—Transactions have been confined to orders from consumers for immediate uses, usually small lots of Foundry grades. The present features are all incident to this season of the year—evening up to "take account of stock" before the 1st of January. The market has been unusually pressed by holders desiring to realize, to enable them to make the usual settlement at season, and prices on some kinds have been made lower than former quotations; otherwise supply and demand govern. Quotations for sales in the past week are justified by the following: Best Hanging Rock Charcoal Foundry Pig Iron, $27; good, $26 @ $26.50; Best Hanging Rock Coke Foundry Pig Iron, $24 @ $24.50; good, $23 @ $24; Best American Scotch, $22.50 @ $23.50; No. 2 of above kinds, 50¢ to $1 less; Silver Grey Softeners, No. 1, $23; No. 2, $22; No. 3, $21; Cold-blast Charcoal Car-wheel Iron, $30 @ $35; Warm blast Charcoal, $26 @ $30; Forge Iron, $20.50 @ $24 for grades, Coke, Stonecoal and Charcoal kinds.

LOUISVILLE.

MESSRS. GEO. H. HULL & CO., Commission Merchants, report to us as follows, under date of November 24, 1882: There is a considerably better feeling in Iron. Many large sales for future delivery have been booked, and a good many parties are in the market for 6 or 12 months' delivery. There is considerable difference, however, between the views of buyers and sellers. Sellers are very firm. We quote, for cash, in round lots, as below:

FOUNDRY IRON.

No. 1 Hanging Rock Charcoal	$27.00 @ 28.00
No. 1 Southern Charcoal	24.00 @ 25.00
No. 1 Hanging Rock Stonecoal and Coke	23.00 @ 24.00
No. 1 Southern Stonecoal and Coke	23 00 @ 24.00
No. 2 Southern Stonecoal and Coke	22.00 @ 22.50
"American Scotch	22.00 @ 23 00
Open Silver Gray	21.50 @ 22.00
Close Silver Gray	20.50 @ 21.00

MILL IRONS.

No. 1 Charcoal	22.00 @ 23.00
No. 1 Stonecoal and Coke, Neutral	21.00 @ 21.50
No. 2 Stonecoal and Coke, Neutral	20.00 @ 20.50
No. 1 Stonecoal and Coke, Sold-short	20.00 @ 21.00
No. 2 Stonecoal and Coke, Cold-short	19.50 @ 20.00
White and Wottled, Cold Short and Neutral	18.50 @ 19.50

CAR WHEEL IRONS.

Hanging Rock, Cold-blast	30 00 @ 32 00
Hanging Rock, Warm-blast	26.00 @ 27.00
Alabama and Georgia, Warm and Cold-blast	30.00 @ 31.00
Central Kentucky, Cold-blast	28.00 @ 32.00

W. B. BELKNAP & Co., Iron and Steel Merchants, Nos. 113 and 115 Main street, report to us as follows, under date of Nov. 25, 1882: The market for Iron and Iron product generally is weakish, aggravated by bear reports from Wall street and interviews and rumors of still further decline in Steel Rails. At the same time we think it would be difficult to place a large assorted order for immediate delivery at much lower rates than prevailed a week or even two weeks ago. A manufacturer here who wanted 200 tons No. 1 Mill Pig, prompt delivery, has experienced difficulty in finding same. Southern furnaces are well sold up, and if there is distress anywhere it must be with those concerns that are unfortunately located. The weather has been most propitious for all kinds of work, but it would be strange if the abatement in activity incident to late November and December in heavy goods should not be manifested this year. In the midst of discouraging rumors, as we say, the news comes of the formation of a Bessemer Steel company in Wheeling, with $1,000,000 capital, which has certainly some significance. We quote as follows: Bars, in fair demand, but in liberal supply, $2.50 @ $2.60; Heavy Sheet, in ordinary demand—the price is well maintained on these; Light Sheets are scarce and in insufficient supply at $4.80 @ $5; Nails are still scarce, and the demand is, if anything, more urgent than at any time since the strike closed. General Hardware is moving in good quantity; many prices are so low that the goods are considered favorable investments for next year.

ST. LOUIS.

MESSRS. HOFFER & Co., Pig Iron and Iron Ore Merchants, 417 Pine street, report to us as follows, under date of Nov. 25, 1882: There is no quotable change in this market since our last week's report, the threatened stoppage of Steel mills having a bad effect. Quotations are:

HOT BLAST CHARCOAL.

Missouri	$21.00 @ 22.00
Ohio	25.00 @ 27.00
Southern	23 00 @ 24 00

COKE AND COAL.

Ohio	23.00 @ 26.00
Southern	24.00 @ 25.00
Missouri	21 00 @ 22.00

MILL IRONS.

Red Short	21.00 @ 22.00
Neutral	20.00 @ 22.00

CAR WHEEL AND MILL IRONS.

Missouri	26.00 @ 28.00
Southern	30.00 @ 33.00
Ohio	27.00 @ 35.00

BALTIMORE.

W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, reports us the following, under date of Nov. 27, 1882: Trade, which has ruled very dull for some time past, now shows some signs of improvement, inquiry being more active and the movement stronger. We continue our last quotations unchanged:

Ref. Bar Iron, 1 to 6 x ⅜ to 1	℔ ℔	2 6-10 @ 2 7-10¢
" " 1 to 4½ x 1¼ to ⅝	℔ ℔	2 6-10 @ 2 7-10¢
" " ¾ to 2, Round and Square	℔ ℔	2 6-10 @ 2 7-10¢
Hoop Iron, 1½ wide and upward	"	3½ @ 3¾¢
Band Iron, from 1½ to 6 in. wide	"	3 @ 3¼¢
Horse-shoe Iron	"	3½ @ 3¾¢
Norway Nail Rods	"	5¼ @ 6 ¢
Black Diamond Cast Steel	"	12 @ 13 ¢
Machinery Steel	"	6 @ 7 ¢
Spring Steel	"	5 @ 5½¢
Common Horse Nails	"	10 @ 11 ¢
Railroad Spikes, 5½ x 9-16	"	3¼ @ 3½¢
Perkins' Horse shoes ℔ keg of 100 ℔		$4 87½
" Mule shoes		5.87½

FOREIGN.

FRANCE.

(*Moniteur des Interets Materiels.*)

PARIS, Nov. 12, 1882.—*Metals*—There is a slightly improved feeling; Metals are, nevertheless, all lower. We quote toward the close: *Copper*, Chili Bars, 177.50 @ 181.25; Ingots and Slabs, 185; Best Selected, 190, and Pure Corocoro Ore, 180. *Tin*—Banca 267.50; Billiton, 266.25; Straits and Australian, 264.75, and English, 262.50; *Lead*, 34.50 @ 35.25, and *Spelter*, 42.75 @ 43.25, all in francs ℔ 100 kg. *Iron.*—The general situation in France, in the Iron and Steel branch, remains as favorable as when we last reported; there is no abatement in orders, and no giving way in prices. In this manner the winter season is inaugurated under encouraging auspices, so as to prelude all fear of an immediate unpleasant reaction. Everybody seems to conform himself to the higher range of values in Pig Iron and Coke. In the Ardennes a satisfactory amount of trade is transacted in Coke Merchant on the basis of 19 50 francs ℔ 100 kg., delivery during the first quarter of the coming year, and for Chains, 21.50 @ 22 is paid. Sheets move off well at 25 francs for 3 mm. thickness. Wire Nails active, but not firm, at 29.50. Ordnance manufacturers are fully engaged. In the Haute-Marne most makers are under engagements covering the next 10 months.

BELGIUM.

(*Moniteur Industriel*)

BRUSSELS, Nov. 19, 1882.—*Iron.*—Makers in Belgium are of good cheer, since all Finished Iron, Sheets in particular, move off with such ease at remunerative rates, notwithstanding the advanced season. At first they had some doubts as to whether consumers would subscribe readily to the present ruling, rendered necessary by the enhanced cost of Pig Iron and Coal, but these doubts have now been dispelled, and we have every reason to look forward to a good winter campaign, which we trust may pave the way for a favorable spring opening. We quote: No. 1 Merchant, 12.75 francs ℔ 100 kg.; Beams, 14.75; Corners, 15.25; Sheets, 19 @ 20; Steel Rails, 16; Hoops, 23.50; Axles, 24.50. *Coal* has been very active, consumption being unusually large. Prices are steady. Speculators for a rise do not operate for the moment. We quote: Coal for family use, ℔ ton, 17 @ 21; Gas Coal, 20; Mixed, 9 @ 13; Coal for coke, 11 @ 12; Coke, 19, and Half washed, 21 @ 22 francs. *Metals.*—A decline of some moment has occurred both in Copper and Tin. Lead has been upheld, but the tendency is weak. Spelter has remained steady. We quote: Copper, 182 50 francs ℔ 100 kg.; Banca Tin, 200; Billton, 258; Lead, 34. and Spelter, 21.50. The downward course of the first three metals named has been caused by the weakness abroad. Consumption in Belgium has been all that could be wished latterly.

GERMANY.

(*Borsenhalle.*)

HAMBURG, Nov. 12, 1882.—*Iron.*—During the week under review Merchant and other finished Iron has just maintained some steadiness, and this with some difficulty in the German Iron regions. Pig has been irregular in the extreme, puddling Pig evidently tending downward. Spiegel has, meanwhile, given way somewhat. Coal has not varied in price; shipments from the mines are very large, so that even at this early stage the sufficient amount of cars cannot be mustered with ease. The official export figures in the Iron line, just published, show a notable decrease in Pig for the first nine months of the year, 140,891 tons, against 186,416 last year, same time; Hoops, Corners and Steel Rails, 127,639, against 185,492; Sleepers, Iron Bridges, Anchors and Chains, Axles and Car Wheels, 5,145 tons, against 12,457. On the other hand, the export has increased in Sheets, heavy Hardware, Wrought-iron Tube and Iron Wire, 107,334 tons, against 109,219 in 1881. Iron Wire has become our leading export article in the line, more important even than Pig and Rails. German Wire now supersedes that of all other nations in the world's markets in point of quantity, being three times what England exports thereof, while large amounts go to the latter country. Locomotives have also done well—9176 tons, against 4807 in 1881, and other machinery, 52,912 tons, against 41,548. Machinery is shipped from Germany chiefly to Austro-Hungary, Russia and France. *Metals.*—Lead has been lifeless. English at 16 @ 16.50, and German at 14.50 @ 15; Copper has been barely sustained at 77 @ 79; Tin is firm at 110 @ 113, and Spelter inanimate at 17 marks.

AUSTRIA.

(*Austrian Trade Journal.*)

VIENNA, Nov. 12, 1882.—*Iron.*—Not much of special interest has occurred in Austro-Hungary; the market maintains its steadiness, notwithstanding the weakness across the Channel. The wholesale trade in Iron is quiet; the large deliveries taking place originate from former contracts. While this is the case little transpires in the way of new contracts on a larger scale in either Pig or Finished. There is, it is true, a steady current of orders in a moderate way, but in the aggregate these do not sum up sufficiently to impart animation to the general aspect. A few dealers have offered in Bohemia and Hungary lots of Merchant rather below the current market range, but even these concessions have not proved attractive. The lull we witness at present is mainly due to the advanced season, and more so, we are inclined to think, than to a lack of confidence in the future stability of the market. Since that portion of the monarchy chances to be ruled by enlightened, clear-sighted statesmen determined to make the best of the natural resources of the country, the results are substantial and attract capital from all quarters. Our manufacturers in the Iron and Steel line find it daily more difficult to compete to advantage in that part of Austria. Iron is firm at Vienna; Pig at 52 @ 59 florins ℔ ton; Merchant at 115 @ 130; Sheets at 170 @ 200, and Beams at 130 @ 135. *Metals* are weaker. We quote ℔ 100 kg.: Copper, 84 @ 87; Tin, 130 @ 132; Lead, 17.50 @ 19, and Spelter, 19.50 @ 21.50.

Furnace Slag and Bauxite for Cement.—According to *Stahl und Eisen*, Herr Roth, of Wetzlar, Germany, uses bauxite in the manufacture of cement from blast furnace cinder. Bauxite consists principally of alumina hydrates, besides small quantities of sesquioxide of manganese, titanic acid, lime, magnesia, alkali, &c., but its chemical composition varies according to the localities where it is deposited. Its name is derived from the place where it was first discovered, Les Baux, in France; it also occurs in the Charente. In Italy it is found in Calabria; in Ireland, near Belfast; in the Austrian Empire, in Krain, Styria and Lower Austria. In Germany bauxite occurs on the southern slope of the Westerwald, near Mühlbach and Hadamar, also at the Vogelsberg, in Upper Hessen, and at Klein-Steinheim, near Hanau. If 100 parts of furnace cinder, which crumbles by itself, are mixed with 85 parts of limestone or chalk (containing 98 per cent. of carbonate of lime and 2 per cent. of silicic acid) and 15 parts of bauxite (containing 48.5 per cent. of alumina, 13.52 per cent. of sesquioxide of iron, and 9.40 per cent. of silicic acid; the composition of the bauxite found near Gissen), and burned, the product yielded—supposing that half of the sulphur escapes from the slag as sulphuretted hydrogen—is 158.66 parts of cement of the following composition: Lime, 61.9 per cent.; silicic acid, 24.1 per cent.; alumina, 10.6 per cent.; sesquioxide of iron, 1.3 per cent.; protoxides of iron and manganese, 0.8 per cent.; magnesia, 1 per cent; sulphur, 0.3 per cent. The cinder used was obtained in the production of foundry pig in a coke blast furnace, and if the cinder to be employed is of a different composition, the fluxing materials must, of course, be varied. Mr. Roth states that the economical advantages to be derived from the erection of special cement mills near blast furnaces are well calculated to insure a favorable consideration of the project, and further developments may prove interesting.

An Interesting Dry Dock.—The dry dock of the Screw Dock Company, near Catherine Ferry, New York City, is one of the oldest and also one of the most interesting dry docks at this port. There are four large hydraulic pumps and four small ones, the four large pumps performing 80 per cent. of the work. In the winter time alcohol is used in place of water, in order to avoid the danger of bursting the pipes due to frost. A large tank, containing about 25 barrels of alcohol, is in the engine-room. There is very little waste of this alcohol, and it is used again and again until it becomes so weak that upon testing it is found that it will freeze, when, two barrels of additional spirit being added, the entire liquid will be found to stand the freezing test. There are three docks of different sizes. The large dock consists of 26 sections, each 6 feet in width; the middle dock, of 20 sections, and the small dock, of 12 sections. These sections are hung in chains that run over pulleys and are attached to screws. When a vessel is run into one of these docks, the screws on each side of the dock are worked by hand until the keel-box on each section touches the keel of the vessel, when hydraulic power is applied and the vessel's keel is lifted above the surface of the water. The docks, as already indicated, are situated on the East River, and the maximum weight which they can lift amounts to about 1000 tons.

Business Embarrassments.

CHICAGO, Nov. 27.—H. A. Pitt's Sons Mfg. Co., manufacturers of threshing machines and other farm implements, and one of the oldest firms in this line of business, made an assignment to-day to R. S. Minor, the bookkeeper of the establishment. The schedule shows their liabilities to be $230,000 and their assets $350,000. Members of the firm state that they have been selling threshing machines to farmers in the Northwest on three years' time, taking notes. This fall collections have been slow, and the firm has been compelled to borrow money. Not desiring to continue this, and fearing that some of their creditors might pounce on their assets to the detriment of others, it was thought best to make an assignment, and call a meeting of creditors. It is understood that in so doing the firm had the counsel of ex-Governor Jewell, of Connecticut, one of the creditors. They hope to secure an extension of time, and promise to pay dollar for dollar and interest. They say that they have put their assets at the inside figures. They consist of machines in the hands of agents in the country; their plant at Marseilles Ill., and Chicago; finished and unfinished machines on hand, and stock, together with bills receivable to the amount of $225,000, a large proportion of which are put up with banks and others as collateral security. Among the leading liabilities are the amount due on the pay roll, which is $7,500; to the National Bank of Illinois, Chicago, $17,000; to the Safety Fund Bank, of Fitchburg, Mass., $50,000; to the City and Ætna National Banks, of Hartford, Conn., $10,000 each; to the First National Bank, of the same place, $5000; to the Hadley Falls National Bank, Mass., $15,000; to A. F. Judson & Co., Seneca, Ill., $9750; to P. Jewell & Sons, Hartford, Conn., $6975; to Frank Brothers, San Francisco, Cal., $3812, and to the First National Bank of Marseilles, $5000.

J. H. Adams & Son, exporters of hardware, at No. 283 Pearl street, this city, made an assignment yesterday to Almon D Fisk, giving preferences to Mrs. Mary Adams for $3000; Mrs. M. A. H. Welsh, $10,000; D. D. Wright, $3000; A. P. Stout, $2000; Coombs, Crosby & Eddy, $1550; A. F. Pierson & Co., $1378; Smith & Gates, $1971; Hoadley & Co., $2000; Woodhouse & Rudd, $828; A. D. Fisk, $500; total, $26,227. The business had been established over 40 years, and their trade was chiefly with South America and the West Indies. Their capital has not been very large, and the nature of the business was largely on time notes. They have been regarded as gradually decaying, and competition for their trade has been very active.

Wood as a Fuel.

In comparing wood with coal as a fuel, it is safe to assume that 2¼ pounds of dry wood are equal to one pound average quality of soft coal, and that the fuel value of the same weight of different woods is very nearly the same. That is to say, a pound of hickory is worth no more as a fuel than a pound of pine, assuming both to be dry. If the value be measured by weight, it is important that the wood be thoroughly dry, as each 10 per cent. of water or moisture will detract about 12 per cent. from its value as a fuel. It may be interesting in this connection to give the weight of one cord of different woods which are thoroughly dry. These weights are about as follows:

Hickory or hard maple, pounds	4500
White oak, pounds	3850
Beach, red oak and black oak, pounds	3250
Poplar, chestnut and elm, pounds	2350
Average of pine, pounds	2000

The fuel value of these different kinds of wood, as compared with coal, is about as follows:

1 cord hickory or hard maple equal to coal, pounds	2000
1 cord white oak equal to coal, pounds	1715
1 cord beach, red oak or black oak equal to coal, pounds	1450
1 cord poplar, chestnut or elm equal to coal, pounds	1050
1 cord average of pine equal to coal, pounds	925

It is supposed, of course, in both tables, that all the wood has been air dried, and the comparative values of woods not mentioned in the table may readily be approximated by the reader.

Mechanical Traction on Canals.

The problem of dragging canal boats in a more expeditious and less primitive manner than that now pursued appears to have been solved, to some extent, by M. Rigoni, a Belgian engineer, experiments having been recently made on the canal from Antwerp to Liége, with his system of mechanical traction by means of a moving cable. The method pursued is very simple, an endless cable, made of Bessemer steel, being set in motion by stationary engines on the banks of the canal. It is supported along the bank by special pulleys, and directed by return pulleys of large diameter lodged in chambers of masonry under the level of the tow-path. The length of the cable in the case considered was five miles, and the canal was divided into as many sections, each operated by a fixed engine. The latter acts on the cable through a pinching pulley, similar to the Fowler pulley. The attachment of the boats to the cable is by means of checked nippers embracing the cable, and on coming to a supporting pulley, or a pulley at a curve, the nippers pass without releasing the cable. One of the principal advantages of M. Rigoni's system is a considerable increase of speed. At present the daily stretch covered in hauling with horses is from 10 to 11 miles, and with men only from 7 to 8 miles, but by the new method it is said that a speed of 3 miles an hour can be easily attained. It is claimed, moreover, that the system is more economical, both in the capital required at first, and in the cost of working, as compared with other systems, and its adoption will perhaps enable canal companies to compete more successfully with railways with regard to rapidity of transit.

Metallic Gas.

According to our contemporary, *Iron*, of London, England, a new departure in the manufacture of illuminating gas has recently been made in Liverpool. The new illuminant is described as metallic gas, and is the invention of Mr. John Dixon, of the above town where a company has been formed for working the patent. Mr. Dixon claims for his invention the production of improved gas for illuminating purposes by the decomposition or dissolution of the component parts or constituents of metals, earths, acids, carbon and hydro-carbon substances, and the salts of alkalis, the dissolution of the substance being caused by heat. It has long been known that certain chemical substances, when strongly heated, produce flames of peculiar colors, which, when blended, produce a white light, and, acting on this knowledge, the inventor has produced an apparatus capable of manufacturing and storing a gas the result of the decomposition of the chemicals above referred to, so that now he is prepared to supply a gas which, he says, is not only superior to, but much cheaper than any other. The model works in the Commercial Road, Liverpool, are capable of supplying gas for upward of 1000 ordinary burners. The estimate of the inventor is that, whereas 1000 men will produce a given quantity of coal gas, three men under his system will obtain a like quantity of metallic gas, which will give a light of six times the luminosity. In every way has the metallic gas been tested, and in some instances it has been stored for upward of twelve months, and its virtues were found to be unimpaired. It has been found to travel any distance through the ordinary mains and pipes, and without condensation. In the manufacture of the metallic gas, retorts are employed similar to those of the ordinary gas-works. The retorts and their contents are then heated to a cherry-red heat. After generation in the retorts, the gas is led through a pipe, and the condensed vehicle is deposited in a recoverer. The function of the recoverer is to extract, as far as possible, the kerosene used in the retort supplier. The gas is subsequently taken to the purifier. Entering the purifier at the bottom and issuing from the top, the gas is led to and stored in a gasholder from whence it is supplied through mains for use. The gas is of a dry nature and nearly incondensable, and is not affected by extreme cold. Mr. Dixon is able to recover the vehicle, such as kerosene, used in the generation of his illuminating gas, and, afterward distilling it, he uses it again to generate more of the gas for consumption. It is stated that the residue, when practically discarded for gas purposes, can be turned into good account, and aniline colors, benzol, ammonia, carbon and other valuable products obtained from them. With regard to the illuminating power of the metallic gas, it is stated that it has been tested many times by having two jets in a dark room, one being the gas supplied by the Liverpool Gas Company, and the other the metallic gas. The gas company's burner is a No. 2, while Mr. Dixon's is a No. 0, and yet, when tested by a Wright's photometer, the luminosity of the latter over the former is stated to be as six to one, affording a clear, brilliant white light, and not at all fatiguing to the eyes. An important feature claimed for the gas is its purity, and the entire absence of any obnoxious smell or smoke. Altogether, the report submitted is exceedingly favorable, and the adoption of the illuminant in practice beyond the present small works does not seem beyond a possibility.

Lack of Encouragement to Inventors.

f inventors were to rely solely upon the commendation of their friends or the public as an inspiration to labor, says an exchange, there would be few great inventions. The world looks upon inventors as a visionary and unpractical class of people, who merit only condemnation and ridicule. Just before Singer completed the invention of his now famous sewing machine, even his fellow-workmen in the shop where his experimental machine was being constructed left him in disgust, thinking his invention a failure. When Westinghouse tried to introduce his air-brake, he met with the most chilling rebuffs, both in this country and in Europe. Edison, whose inventions are the marvel of the present century, has been the object of unstinted abuse and ridicule. Some of the greatest creations of his wonderful inventive mind were characterized as stupid failures until the demonstration of their successful operation overcame this hostile criticism. Even Thomas and Gilchrist, whose recent invention of the basic process of steel-making is among the wonders of modern invention in metallurgical science, have come in for their share of discouraging criticisms and rebuffs. Thus might we go through the whole list of inventors, from the earliest days to the present, and few would be found who have not experienced the unkind and unmerited opposition, not only of the general public, but in most instances of their own personal friends. The testimony of Fulton, Watts, Franklin and a host of others renowned in the past for their wonderful discoveries would corroborate this statement and furnish forcible evidences of its truthfulness.

Inventors, as a class, are very sensitive to criticism. A part of the reward which they hope to obtain for their invention is a public recognition of its value. None but an inventor can tell how disheartening are the unkind and unsympathetic criticisms which he is forced to listen to; and these criticisms are harder to bear because in most instances they are as unjust as they are unkind, often displaying the ignorance and superficiality of the speaker. That inventors are sometimes unmanned by the ungenerous manner in which their inventions are received is not surprising. A gentleman in one of our western towns, after years of study, has finally brought forth a very meritorious invention. During all these years he has met the studied opposition of his family and friends. His sons have even carried their opposition so far as to refuse to contribute a single dollar toward helping him introduce his invention, now that he has obtained a patent for it, and the result is that, wearied out by the discouragement which his family and friends have placed in his way, he has become prostrated. If, at last, the world shall come to prize his invention for what it is worth, and he shall derive—as he may—a fortune from it, these undutiful sons will, no doubt, be the first to claim a share in the wealth thus obtained.

The man who strives to perfect an invention, whether successful or not, is entitled to the commendation of his fellowmen. We have never sympathized with those who speak sneeringly of that much-despised class of inventors, those who have striven to solve the problem of perpetual motion. Mistaken and erratic as they may be, they are engaged in a line of duty which is, to say the least, honorable and elevating. Thousands of inventions there are to-day that the world calls valueless, which, were they placed in practical hands, would prove most useful and beneficial, and a source of wealth to the owners.

Inventions, as a general thing, are an innovation on present customs or modes, and are therefore a step in advance of present thought. A century since, had any one suggested that one could stand in his own home and hold converse with a friend fifty miles away, he would be thought to be talking nonsense. Had any one at that time said that the mail would be carried from New York to Chicago in a day, he would have been considered equally as foolish. The prediction that messages could be sent on lightning's wing beneath the ocean from this continent to the eastern continent would have been hailed with ridicule. These inventions were steps far in advance of the thought or knowledge of those days. It does not militate against the greatness of the discoveries that made all these things possible that the dull brain of the masses could not comprehend them until they were practically displayed to the world. The further he is in advance of the present thought or knowledge of the masses, the greater will be the opposition which the inventor will have to overcome before he will attain a just recognition of his labors.

A great inventor must be a man of independent thought, a man of nerve and courage, a man of hopefulness and of determination. Many an inventor has been turned back, even when his feet were pressing the threshold of a great discovery, because he had not courage to stem the tide of opposition which he was encountering. Many a practical invention has been dropped before completion because of the inventor's discouragement and lack of push and determination. Twelve years ago a certain inventor filed in the Patent Office at Washington an application for a patent for the invention of a certain article. On some technical grounds the patent was disallowed. The inventor, in the meantime, had been discouraged by his friends, and so ceased pressing his claims. What, then, must be his surprise to find his invention now in quite general use, years after he had surrendered it to the public. The experience of this man is but a sample of the experience of thousands of others.

It is a surprising thought, when contemplating what invention has done for the progress and civilization of the age, that inventors meet with such a tardy recognition of their works. The wonder is that they are not held in higher esteem. The world could afford to pension its Stephensons, its Morses, its Bessemers, its Edisons and its Bells. It has erected statues to some of these, and it can afford to erect statues to all its noted discoverers. In olden times men of scientific attainments were held in high esteem. Why ought they not to be held in a like high estimation to-day?

We grant that the names we have given above are so held, but there are untold thousands of names of inventors of useful things, valuable and indispensable to the world, that should be placed in glowing letters on the scroll of fame. Our inventors need encouragement when they are alive, not after they are dead. Men do not work simply to gain a fitting epitaph. Their needs are in the present, and the earlier the world recognizes and applauds their work, the better will it be for them and the inventive art.

A test of a patent fire-proof material for incasing the beams and framework of buildings was recently made in Schilling's stoneyard, at Ninety-second street and Avenue A. A huge oven was erected, the top of which was coated with the material and represented the ceiling of a room. Above this were five wooden beams, on all sides of which were nailed slabs of the material 1 inch thick, and above these again was a wooden floor. Slabs of the material, about 1 inch thick, were nailed between the beams, midway between the floor and the ceiling, and across the flue of the oven was another incased beam. After having been exposed to a fierce fire for about an hour and a half it was found that a part of the ceiling had fallen, and that the beam across the flue was only slightly charred on the edge from which the material had fallen, while the floor above the oven had been heated only to a slight extent. It was stated by Messrs. Hubert & Pierson, under whose supervision the experiment was carried out, that iron beams could not stand the test, as had been the case with the wooden beams here mentioned.

The so-called postal telegraph, now being constructed between New York and Chicago, will have some novelties which are expected to be great improvements on modes and mechanisms of telegraphy now in general use. The wire is a core of steel enveloped in copper deposited by electrolysis. Great care is needed to insure the perfect inclosure of the steel by the copper, but the tests made thus far are said to prove the excellence of the work.

Importers of goods by way of Cape of Good Hope, whose importations on and after January 1st, 1883, will be exempt from the 10 per cent. discriminating duty, are making preparations to ship bonded stock to England, so as to escape the levy.

The Shaw Locomotive Company have placed their locomotive, the Henry F. Shaw, in the hands of a special committee of the Franklin Institute, for the purpose of making a special test of the merits claimed.

INDUSTRIAL ITEMS.

MASSACHUSETTS.

The Phœnix Mfg. Co., of Taunton, is probably the oldest establishment engaged in the manufacture of crucibles in this country. The company manufacture crucibles on a large scale, turning out about 150,000 crucibles of various sizes per month. Two large kilns, one of which is claimed to be the largest in the country, having a capacity of 3000 pieces, are in connection with the works. The goods are of good quality, and are shipped to all parts of the United States. The clay employed in their manufacture is imported from Germany, while the plumbago used comes from Ceylon. The origin of the company dates back as far as 1844, and it was organized as a corporate body in the year 1851, under an act of the Legislature of Massachusetts. The present officers of the company are C. R. Vickery, president, and Henry S. Atwood, secretary and treasurer.

The Springfield Glue and Emery Wheel Company, Springfield, have just furnished one of their 40-inch automatic knife-grinders to the E. N. Welch Mfg. Co., of Forestville, Conn. The machine in question is provided with a head and tail stock, which is attached to the machine so as to grind the rotary sheers manufactured by the above company.

Mr. William Perry of Brockton, has in course of erection a new iron foundry, which he expects to have ready for occupancy the latter part of January. The building will be 130 by 50 feet in plan, with an extension 48 by 30 feet.

CONNECTICUT.

Messrs. A. M. White & Son, of Waterbury, manufacturers of special machinery, completed a short time since a machine for cutting match sticks. It occupies a space of but 26 by 30 inches, 2 feet in hight, and is capable of cutting 960,000 matches in a day.

NEW YORK.

Messrs. Sniggs & Co., of Buffalo, manufacturers of all kinds of wood-working machinery, desire to inform their patrons and dealers in their line generally, that they now occupy their new shops, Nos. 54 to 60 Mechanic street, where, with new and improved machinery, they are prepared to furnish everything in their line on short notice.

NEW JERSEY.

The Andora Iron Co., which recently leased the mining rights on the farm of Samuel Green, near Danville, have thus far sunk their shaft to a depth of 60 feet, and the ore encountered is said to be of very good quality, giving every promise of being among the best veins of Bessemer ore yet discovered in that locality. Another shaft is now being sunk in the same neighborhood, with good prospects of striking the same kind of ore.

Messrs. Cooper and Hewitt are making extensive improvements at their Pequest furnace. They have increased the hight of the the stack from 58 to 68 feet, and are putting in additional boilers and hot-blast stoves, by means of which it is thought that the product will be increased by about 100 tons per week.

The Belvedere Iron Company are constructing a railroad from their iron mine on the Brokaw farm 2½ miles to Buttzville, on the Lehigh and Hudson River Railroad, which they expect to have in operation in the latter part of December. The ore bed is reported to be over 70 feet in width and very rich, the ore being low enough in phosphorus to be suitable for Bessemer steel. The same company have also quite recently discovered another vein of iron ore on the farm of Mr. George Kiser, near Oxford Meeting House, and it is probable that operations will be soon commenced with a view of further developing it.

PENNSYLVANIA.

The Point Bottle Works, Limited, is the name of the concern which succeeds the Rochester Flint Vial and Bottle Works, suspended some time ago. The new organization is a joint stock company with a capital of $20,000, in shares of $500 each. P. H. Coyle is president; William McCague, treasurer; E. Kelb, secretary, and L. Strickler, manager of the company. These gentlemen also constitute the directory. The buildings of this works are ample and convenient, occupying a space of 70 by 70 feet and containing one 12-pot bucket teazer furnace. The company will manufacture a full line of flint prescription vials and bottles, and will employ about 115 hands. They have everything now in complete working order, and will commence to make glass on November 27.

McIlvaine & Sons, of Reading, have notified their hands that they will shut down entirely next week. Three hundred employees will be thrown out of work. Poor trade is stated as the cause for suspending work.

The upper mill of the Laurel Iron Works, Chester County, has been stopped for some time for repairs. The lower mill, which has also been undergoing repairs, is in operation again.

Extensive additions are being made to the works of the Phœnix Iron Company, Phœnixville. Among the improvements is the erection of a 22 inch train of rolls in the new mill for rolling merchant iron from the crop ends and scrap iron which accumulate in the works. The improvements will be completed by the first of the new year.

The St. Charles Furnace, Columbia, has blown out for repairs.

Various improvements are being made at Bechtelsville Furnace, and large stocks of ore are being shipped to it. The stack will be blown in shortly.

The Standard Iron Works, Norristown, have shut down on account of light orders and heavy stock.

Aurora Furnace, at Wrightsville, has blown out for repairs.

The company erecting the new glass works at New Castle will go under the name of Knox, Foltz & Co. It is composed of Forbes Holton, Wm. S. Foltz, John W. Knox, Mrs. Samuel Foltz and Miss Maggie Foltz. It is a limited firm; capital stock, $48,000, and paid up. The president is Wm. S. Foltz; secretary and treasurer, John W. Knox; board of directors, John W. Knox, Forbes Holton and Wm. S. Foltz.

The Colebrook Furnaces, at Lebanon, belonging to the Coleman estate, have been in bad luck recently, one of the stacks having an explosion at the tap-hole and two hot-blast ovens disabled, and the other having a crippled elevator. It is thought, however, that both furnaces can be kept in blast.

At a meeting of the subscribers to the projected nail factory in Danville, the name "Danville Nail and Manufacturing Company" was agreed upon. Directors were elected for the first year at the meeting. A charter will be applied for and the erection of the works will be commenced in a very short time. The capital stock of the company is $75,000.

Henderson Furnace, at Sharpsville, formerly called Allen Furnace, is now ready for blast.

Messrs. W. H. Barber & Co., of Allentown, have recently furnished a 40-inch turbine and a large amount of gearing to Mr. R. W. Jennings, of Sparta, Tenn., and also two 36-inch Eureka turbines, cut gearing and machinery to H. C. Snyder, of Washingtonville, Penn.

PITTSBURGH AND VICINITY.

Oliver Brothers expect to have their new bolt mills in operation by January 1, 1883. They are situated on South Fifteenth street. —*Pittsburgh Dispatch.*

The iron roof factory of Kenney & Reed, on South Carson street, is soon to be enlarged to five times its present size. The ground for the improvement has already been leased.

The new blast furnace built by the Manchester Iron and Steel Co. is now finished, and work will be begun in a few days. "There is no doubt," said a gentleman who is posted in the building of blast furnaces, "but what this is one of the finest in the two cities."—*Pittsburgh Leader.*

The Pittsburgh Tool Company are about to start a machine shop in this city of the nature of the small tool manufactories of New England. They propose manufacturing reamers, twist drills, taps, dies, set and cap screws and kindred articles. Works of this kind will supply a long-felt want in this city.

Fire has been lighted in the new glass furnace of Bryce Bros. This will make three now in operation.

The American Iron Works, of Pittsburgh, have in progress of erection an addition to their works. The size of the new building is 240 by 70 feet and 22 feet in hight. This will make their establishment the largest of its kind in this country.

MARYLAND.

The new works of the Baltimore Car Wheel Company in course of erection at Baltimore, cover nearly 10 acres of ground. The machine shop is 100 by 60 feet in plan, and is two stories in hight. The foundry covers a space 36 by 60 feet. The establishment will make use of two cupolas and will have a capacity of 400 car-wheels per day.

OHIO.

The American Wire Company, which is a new organization, is erecting at Cleveland, Ohio, one of the finest wire-drawing plants in the country. Its president is Charles A. Otis, of the Otis Iron and Steel Company; vice-president, Samuel Andrews; general manager, Samuel A. Sague; treasurer, Thomas Jopling; secretary, John C. Andrews.—*Iron and Steel Bulletin,*

The new Smith Foundry Company have commenced operations in New Philadelphia, having made their first run on November 24th. The cupola is of 150 tons capacity per day.

A new organization, known as the American Wire Company, is putting up in Cleveland what is probably the finest wire-drawing plant in this country. The president of the concern is Mr. Charles A. Otis, of the Otis Iron and Steel Company.

The Whitman & Barnes Manufacturing Company, of Akron, have been busily engaged for some time past in improving and enlarging their several factories. Among other improvements they have built a new shop at St. Catharines, Ont., and equipped it throughout with new and improved tools.

Messrs. Cox & Prentiss, of the Cleveland Twist Drill Company, have recently added new and improved machinery to their establishment which will greatly increase their facilities for the production of special tools

WEST VIRGINIA.

The newly incorporated Wheeling Steel Company, capital stock $1,000,000, will at once begin the erection of their works. The incorporators are J. N. Vance, of the Riverside Iron and Nail Company; A. Wilson Kelly, of the Belmont Nail Works; W. H. Wallace, of the Jefferson Iron Works, of Steubenville; J. R. McCartney, of the Bellaire Nail Works; C. D. Hubbard, of the Wheeling Iron and Nail Works; L. K. Wallace, of the La Belle Nail Works, and Alonzo Loring, of the Benwood Iron Company.—*Pittsburgh Telegraph, Nov. 22.*

Yesterday the experiment of heating and rolling steel in the usual iron heating furnaces and rolls was tried at the Riverside lower mill, in charge of Mr. Jacob Bowman, the well-known heater. Nine ingots of steel, corresponding to the piles in iron, were heated and rolled into sheets. The experiment was regarded as reasonably successful, though not complete, the sheets having been cut into nail plate, but no nails yet cut. This it is the intention to do to-day, and the plates will then then be cut as were those procured in Pittsburgh last week. The nail plate is not considered as good as that which came from Pittsburgh, but it was not to be expected that it would be at the first crude experiment. The manufacturers expressed themselves as more than satisfied with the results of the trial, so far as it went.—*Wheeling Intelligencer.*

The mill of the Kloman Steel and Iron Company, at Moundsville, is running single turn, the puddlers making six heats.

INDIANA.

At the recent fair held at Little Rock, Arkansas, the first premium for the best slide-valve on exhibition was awarded to the Atlas Engine Works, of Indianapolis.

NEBRASKA.

Mr. R. E. Roberts, of Belle Creek, has recently received from the Lane & Bodley Co., a 50-horse-power engine and boiler.

Semi-Centennial of Baldwin's Locomotive Works.

It was 50 years ago on Thursday last since the first locomotive built in Philadelphia made its trial trip on the Germantown and Norristown Railroad. It was built by Mr. Mathias W. Baldwin, the founder of the large establishment which now bears his name, and who, in the year 1825, while engaged in the manufacture of bookbinders' tools and calico printing presses, constructed an upright engine for his own use, which, on account of its desirable features, attracted a number of orders for others of a similar pattern, thus directing the attention of Mr. Baldwin to locomotive designing. A miniature engine was built in 1831, and somewhat later a full-sized engine was constructed for the Germantown Railroad, which, at that time, was drawing its cars by horses. The engine weighed five tons, cost $4000, and was named Old Ironsides, and the time occupied in building it was about one year. Subsequent improvements enabled the builders to attain a speed of 30 miles per hour, which, at that time, was considered to be a very good result. In the year 1835 the present site was occupied, and in the succeeding years rapid progress was made. Mr. Baldwin had various men associated with him in business up to the time of his death in the year 1866, and the present title of the firm, Burnham, Parry, Williams & Co., was taken in 1873. The employees of the works observed the anniversary by attending performances at different theaters, tickets having been furnished by the firm.

A New Method of Signaling on Trains.

Within the past few days the Providence and Worcester Railroad has been supplying its cars with an apparatus enabling the conductor to signal to the engineer by blowing the whistle from any portion of the train. The appliance is described as being somewhat similar to the automatic air-brake, and consists of a pipe running underneath the cars, with couplings at either end. Attached to the pipe at one end of each car is a smaller pipe running to the top and across to the center, where a valve is fixed. Over this valve is the hole for the signal rope, which is attached to the valve. When the conductor wishes to signal he pulls the rope, which runs through the car, the same as he formerly pulled the bell rope. This opens the valve, the air escapes, and the whistle is sounded by the release of the air from the pipes. The advantage of the new arrangement is readily apparent. With a long train the conductor was formerly obliged to give a long pull at the bell-rope, ofttimes bringing it half way to the floor of the car, and even then was not sure that the bell rang, or that it responded to his signal as he wished it to do, while, as a matter of fact, it often did not respond. Now he has only to pull a rope the length of the car at most, and can readily tell whether or not the valve responds, knowing that if it does the whistle is giving the desired signal to the engineer. In case one of the cars in the train is not provided with this new arrangement, the bell rope is hitched as usual, and if the conductor wishes to signal from that car it is simply necessary to pull the rope, thus opening the valve in the next car. A number of the cars of the above road are said to have been fitted with the new arrangement, which, it is understood, will be applied to all.

A Water Curtain for Theaters.—In order to obviate the dangers and difficulties attending the extinction of fire in theaters and in other buildings, and to confine the fire as much as possible within a limited area, Messrs. McLennan and Owen, of London, England, have devised a water curtain which embodies some interesting features. A tank containing a continuous supply of water is fitted over the part to be protected, and in this tank a curtain of woolen material is kept immersed, which, when required, is caused to descend by its own weight, forming a fire-resisting screen. The suctional nature of the material attracts the water down the curtain in a syphon-like manner, forming a complete cascade of water flowing down the already saturated curtain, which the flames cannot burn. The curtain, it will be seen, has the advantage of forming a perfectly fire-proof screen the the instant it is required, and can be lowered into the fire without being burned or receiving any damage, this being a feature of considerable importance. Thus far we have no knowledge of any tests having been made with the appliance, but it certainly seems to merit some attention.

Railway Signals with Automatic Action.—The Chemin de Fer de Lyon is at present trying a hydro-dynamic apparatus, devised for automatic working of fixed and detonating signals. This is placed on the line, and consists of two pedals supported by solid springs on the top of two piston-rods working in cylinders which contain glycerine, and communicate with each other by valves. When a train passes it produces on these pedals at the side of the rail a movement like that of a balance seeking the position of equilibrium. It is the last wheel of the train that causes the signaling action; impressing the second pedal, which it touches, it drives the liquid into the other cylinder, and the piston in that being connected by a jointed rod with a disk or with a detonating signal, the latter is affected. In the case of detonating signals the inventor provides a sort of toothed wheel carrying 60 of them. The signals, which have central percussion, are replaced automatically by a simple mechanical arrangement.

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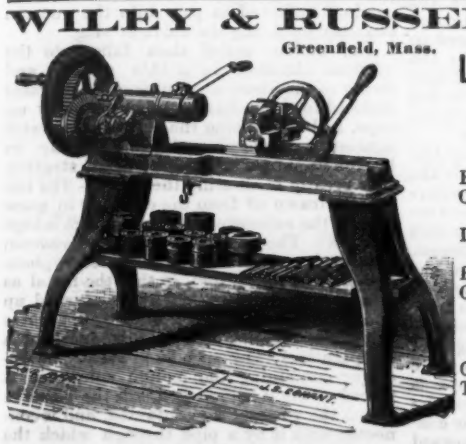

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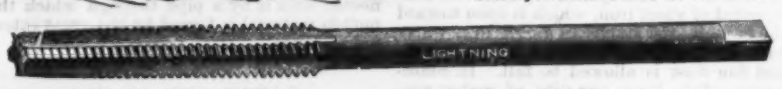

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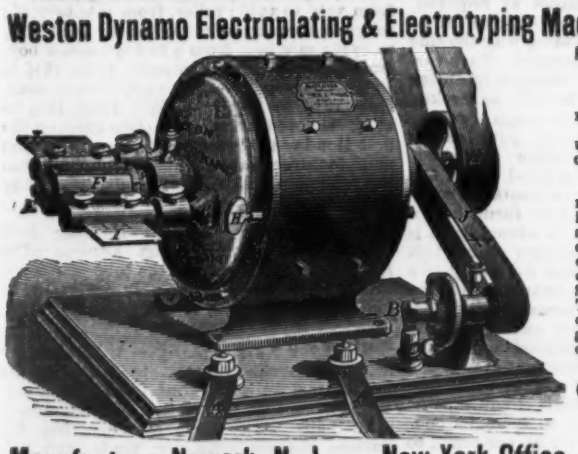

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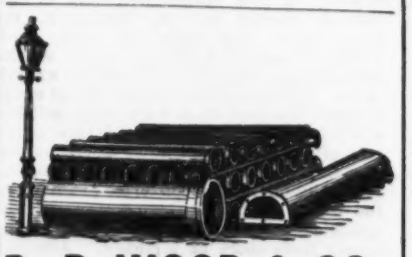

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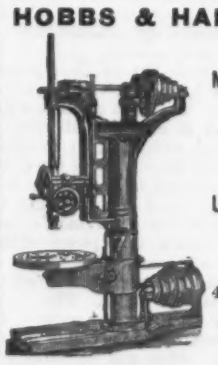

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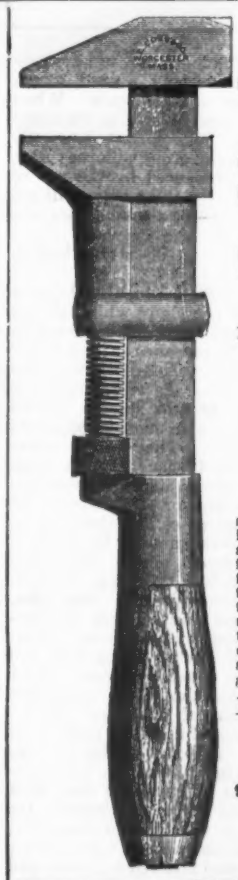

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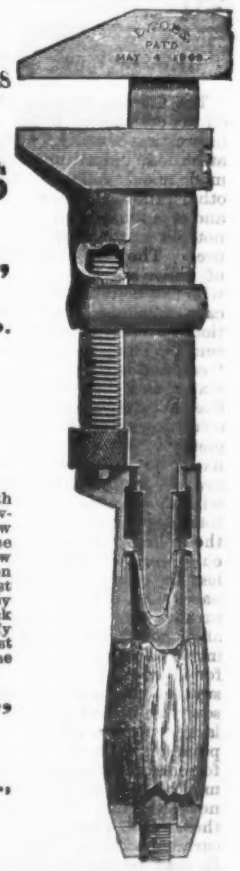

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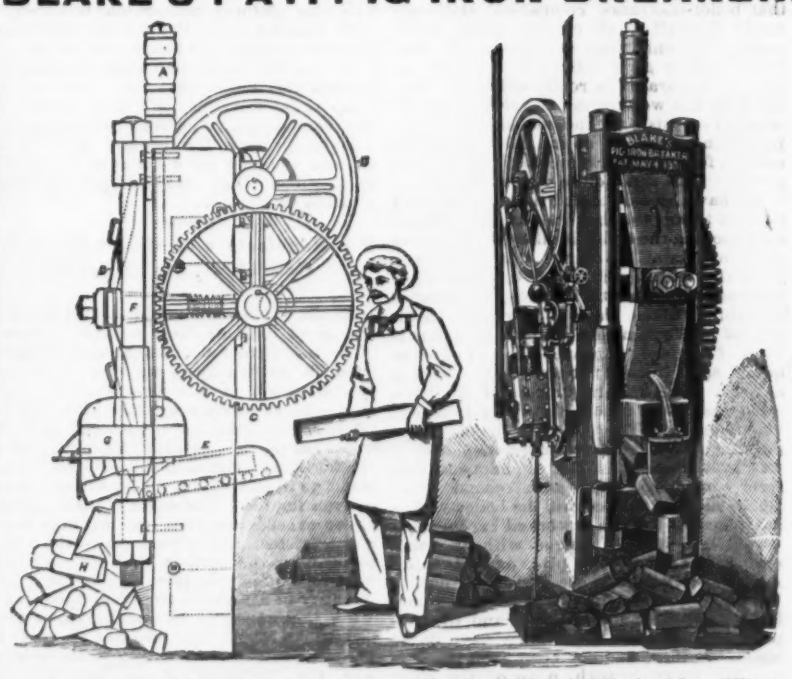

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The Collapse of Boiler Flues.

The London *Engineer*, in a recent editorial on the collapse of boiler flues, submits some interesting remarks which are worthy of attention. More mistakes, it is stated, are made about collapsed flues than about any other failure which can happen to a boiler, and it is almost impossible to impart correct notions on the subject to the average steam user. The same may be said of the majority of boiler makers, and the number of those who can be made to understand that every case of collapse is attended by special conditions worth investigating is probably very small. The popular idea is that when a flue "comes down" the boiler has been short of water, and, though this is very often the case, flues have collapsed and furnace crowns have come down and do come down while there is plenty of water in the boiler and the furnaces have not been unduly pressed. We are not dealing just now, says the *Engineer*, with those collapses of flues which end in the total destruction of the boiler concerned and the killing and maiming of men, women and children. We refer now to that greater or less flattening of the crowns of flues and furnaces with which the engineers of boiler insurance companies are only too familiar, and about which the world at large hears nothing at all. The sums paid in compensation for failures of this kind by most of the insurance companies are enormous. They are so great, indeed, that they absorb by far the larger portion of the receipts of the companies. With due care the annual outlay for compensation in cases of actual explosion may be kept comparatively small, but this is never the fact as regards collapses; indeed, these result from causes over which the insurance companies have little or no control. It may be useful to explain here, for the benefit of the steam user, the nature of the evil influences at work.

The first and most important of these is, of course, shortness of water. The crown of the flue is allowed to become dry; then it gets nearly red hot, and yields under the pressure of the steam. If the metal be good no rending or tearing takes place and there is no explosion. If it be brittle from old old age, or because of what it has suffered at the hands of boiler repairers, there will be an explosion. There are two prominent causes which lead up to shortness of water. The first is beer; the second is to be found in defects in the feed apparatus. Over the first the steam user has no control worth mentioning; for the latter he is wholly responsible. We do not hesitate to say that if an examination could be made of all the boiler-feeding apparatus in the kingdom, it would be found that more than 60 per cent. of it was out of order. We do not speak, of course, of locomotives or marine engines. The boilers of most stationary engines are fed by an engine pump, and one or more donkeys, or else some form of injector. As a rule, either the pump or the donkey is out of order, usually both. We do not mean to say that neither will force water into the boilers; on the contrary, both will do it, but more or less badly, with leaking and thumping, and cobbling up on Saturday nights, and coaxing and petting, and slackening a gland here, and tightening a nut there, and so on. Enginemen go to bed and "leave word with the subordinate who takes night duty that if the feed pumps won't work he is to be called." When some one who has a talent for managing feed pumps is away no water can be got into the boilers. When he comes the glasses can be run up at speed. Scores of our readers will be able to amplify this sketch, and will admit that we have overstated nothing. May we venture to hint that boiler-insurance companies' engineers would do well in all cases to satisfy themselves, not only that the boilers on their books are in good condition, but that the feeding apparatus is really efficient. Only too often the word of the stoker or engineer is taken on this point, no adequate examination being made of check valves, blow-off cocks, feed pumps, injectors or donkey pumps. This is not quite as it should be.

We have already stated that it would be a mistake to suppose that flues always collapse only because the boiler is allowed to become short of water. Nothing can be further from the truth. Flues may collapse either because of cougenital defects, or because something takes place to overheat them. One of the commonest defects in a flue is want of accuracy of shape. Instead of being quite round, it has a flat place in it. This is a weak place, and in process of time the weakness is sure to manifest itself in a very vexatious way. The boiler may have worked for four or five years, during which time it was kept clean. At last it happens that from some cause, such as a second boiler being laid off for repairs, the boiler with a flat place in the flue is worked harder than usual, and it goes longer without being cleaned. Then the flat place extends in dimensions; next it ceases to be flat, a "pocket" of greater or less dimensions being formed in the furnace, and then repairs of no small importance have to be made. If there had not been a flat place in the flue to begin with, none of the other things would have happened; that is to say, there would not have been a pocket made, nor would the furnace have needed a new crown. In welded flues it is expressly necessary to look out for flat places, and the weld ought always to be put below the level of the fire-bars. A flue truly cylindrical of a given diameter is in theory twice as strong as a shell of the same diameter and thickness. Hence came the old and well-known rule—make the flue of a Cornish boiler half the diameter and half the thickness of the shell. Thus a boiler 6 feet in diameter and ½ inch thick would have a flue ¼ inch thick and 3 feet in diameter. Such a flue ought to require twice as great a pressure to collapse it as would suffice to burst the shell, and this supposed extra strength was introduced to compensate for want of accurate roundness of the flue. But in practice it was found that the rule was all wrong. It was not even certain that it was theoretically right, and so ⅜-inch flues go with 6-foot and 7-foot shells of ½-inch or 7-16ths-inch plates, and strengthening hoops are put on the flues, or Galloway tubes put into them, which things are needed, as far as strength is concerned exclusively, because the flues are not round to begin with. It is not to be supposed that they ever will be made round, unless they are rolled in lengths without a weld, which may yet be done on a large scale. When they are riveted there is sure to be a flat strip, because three rolls cannot bend the edges of a plate. Dangerous collapses may be almost entirely prevented by the use of strengthening rings; but these rings will not prevent the formation of pockets, nor the coming down of furnace crowns. These things are independent of strengthening rings.

Another and fruitful cause of collapse is the overheating of the plates while there is plenty of water in the boiler. This result is brought about by the presence in the boiler of something which will drive away the water from the plates. As an example, we may say that a few months since a species of epidemic broke out in certain steamers trading from the Tyne. They had scarcely got to sea when the furnace crowns came down. Engineer after engineer was discharged; but this made no difference. At last matters became so serious that the circumstances were investigated by Mr. Parker, chief engineer to Lloyd's, and he discovered on the furnace crowns a thin slimy coating. Further investigations proved that this, when scraped off and painted over the bottom of an iron bucket, was so perfect a nonconductor that, the bucket being half full of water, its bottom could be made red-hot over a smith's fire and the water would not boil. The formation of this tarry deposit was traced to the use of a special mineral oil in the cylinders. The use of this oil was given up, and no more furnaces were collapsed. Nor is it to be supposed that land boilers are safe from similar influences. On the contrary, it is well known that soft water containing organic matter—such water, for example, as is supplied from rivers and canals in country districts—while incapable of forming incrustation, will throw down a light brown floury deposit in small quantity. If this can settle on a plate over a fire, that plate will become red-hot, and the flue may either collapse or "pocket." Why these two forms of deposit should act as they do is a matter concerning which no certainty exists, while various theories have been formed with which it is not necessary to concern ourselves. Our purpose will have been served if we can induce steam users to believe that by the exercise of vigilance and forethought they can do much to prevent the occurrence of very troublesome and dangerous accidents.

A flue cannot collapse, even partially, without placing a good many people in peril of their lives. Shortness of water, we repeat, is not essential to the bringing down of a furnace crown; but there is no reason to doubt that it is a principal cause of such accidents. It can be best avoided by employing in the boiler-house none but sober men, and by taking care that the boiler-feeding apparatus, whatever it may be, is invariably in a high state of efficiency. As regards the coming down of flues from deposit, this is best avoided either by selecting a suitable water where there is an alternative, or by so heating the water beforehand that the deposit may be thrown down in the heater and not in the boiler. It is impossible to lay down any rule which will meet every case. We may, in conclusion, add a word of warning about boiler incrustation nostrums, of which there are dozens in the market. Some of these are good, some of them bad, a great many neither bad nor good, but useless. A moderate fee paid to a competent chemist for testing the feed-water will, as a rule, be well laid out. If a water is acid, alkalies may be used with advantage to neutralize the acid. If charged with lime, glutinous matters may be employed with benefit to keep the lime in suspension. A boiler composition which is good in one district may be worse than useless in another. It does not follow that the maker of the composition will admit this or even know it. But, composition or no composition, nothing will compensate for neglect in blowing off and cleaning out a boiler as frequently as possible. Dirt and collapse are very prone to go together.

The Manufacture of Steel with Brown Coal at Teplitz, Bohemia.

At the Vienna meeting of the British Iron and Steel Institute, Herr A. Kurzwernhart, of Teplitz, gave a detailed account bearing upon the above subject, and the particulars submitted are of a sufficiently interesting character to merit some attention. In his introductory remarks he stated that the thickness of the deposits of brown coal in the northwest part of Bohemia varies from about 32 to 98 feet, amounting in some places to even 125 feet. The depth of these deposits never exceeds 650 feet, the average being about 328 feet, and in some places the coal is so near to the surface that its successful working presents few difficulties. The quantity of ash varies from 2 to 8 per cent., while the proportion of water ranges from 15 to 20 per cent. The price of the coal, on account of its close proximity to the surface and the thickness of the bed, is very low relatively to that of the mineral fuel raised from the ordinary coal-beds in Austria, the average price being about 50 cents per ton. The existence of these deposits in the district considered, and the means of economical transportation of English iron from Hamburg, via the Elbe, led, in 1873, to the establishment of a Bessemer works and rolling mill near Teplitz, which, since 1881, has carried on the manufacture of Bessemer steel by the basic process.

The arrangements of the Teplitz works differ in some particulars from those of other works of the same character, because they have been specially adapted for the use of Bohemian brown coal as a fuel, and because this point has been particularly kept in view in their construction, so as to enable the use of coke, which is exceedingly expensive in Bohemia, to be entirely dispensed with. So far as concerns the manufacture of Thomas steel with Bohemian brown coal, the method of dealing with the heating of the metal will be here considered only, as the rest of the process does not differ materially from that usually followed in ordinary Bessemer practice. These remarks will therefore be confined to the arrangements and manipulation adopted in heating the furnaces and converters employed in the heating of the lime and the spiegeleisen, the melting of the iron to be used in the converters, and, finally, with the employment of brown coal in the raising of steam. In the heating of the Bessemer converters and the reheating furnaces, there is one and only one respect in which brown coal does not answer all the requirements of the process, and here it is found necessary to supplement the use of brown coal by a fuel possessed of a larger flame. The brown coal has the peculiarity of giving up the least heat at the actual point of combustion, and for this reason a small quantity of coke must be used to aid in heating. It is necessary with the converter to have the interior sufficiently warm directly at the point on which the material rests, and which, on account of the application of the blast, is partly exposed to a cooling influence. Experience has shown that it is not possible by the use of brown coal alone to get the bottom of the converter sufficiently warm.

At Teplitz, much value is attached to the duration of the converter bottoms for as long a period as possible, and it is usual after each cast to push out on an average from two to six acid tuyeres, which is found to be attended with advantage, to the duration of the bottom, as it is thus made impossible for any deep channels to be formed. It will be understood that on this account the top of the converter bottom will become rather cool, as the material that has been introduced, which is generally acid (*quartz chamotte*), allows the steam to escape when the converter is again heated, thus lowering the temperature of the fuel at the bottom of the mass. The gases produced from the brown coal rise naturally, and are completely consumed only when they reach the highest part of the pile, where they also heat the surrounding walls of the converter, while the lower part, and especially the surface of the converter bottom, remains cold and almost black. For this reason, after each charge, and after changing the tuyere, from 7 to 8 kg. (1 kg. = 2.2 pounds) of coke are thrown into the converter, and afterward 150 kg. of brown coal are added. The coke, which has a short flame, delivers its heat directly on the surface of the converter bottom, and this has the effect of thoroughly drying and burning the mass that has been rubbed round the tuyeres, as well as to get the bottom part of the converter to a white heat. With this kind of fuel the converter can, in five minutes' blowing, be made sufficiently hot to commence the treatment of the pig iron. If found necessary this time may, however, be shortened materially.

The ordinary method of manipulating the ladle in Teplitz requires some coke to be used also for heating. With one casting ladle in Teplitz, 120 charges—and, under favorable circumstances, even twice that number of charges—are cast without changing the ladle. In this way the casting hole is inserted from inside, and the ladle is cooled after each charge with water. This process is effected in the following manner: The workman throws into the casting hole of the ladle a handful of clay, after which the hollow ladle is filled with water. After the ladle is thoroughly cooled in this way, the new now casting hole is put in. It is natural that the porous walls of the ladle should in this way absorb a great deal of water, and the short time which is available to allow of the heat being got up again makes it desirable that the best and most effective fuel should be employed. Hence it is that about 5 kg. of coke are always introduced along with about two baskets of brown coal. For every other purpose, however, brown coal alone is employed. The heating of the spiegeleisen and of the lime is carried out at Teplitz at the same time and with the same fuel. The lime is heated only with the surplus heat escaping from the heating of the spiegeleisen. The spiegeleisen is introduced not in a liquid, but only in a very hot condition, and with the exercise of a little care on the part of the workman it need never happen that the spiegeleisen causes any considerable ebullition in the converter; while, on the other hand, the temperature of the spiegeleisen is already so high that it is only a very little short of liquidity. Although the low temperature attained by this mode of working is attended with disadvantage in some respects, it has, on the other hand, the compensating benefit that the whole manganese content of the spiegeleisen is called into requisition. It may be added that a highly-heated instead of a liquid spiegeleisen tends to favor the uniformity of the steel. For the purpose of merely heating the spiegel, as described, the brown coal is sufficient, without any application of gas fuel, and even gives a sufficient surplus to bring the lime to a yellow heat. The furnace used to heat the spiegel and lime is generally furnished with a direct step-grate firing, for the heating of which only nut coal is used.

It is necessary to specify here the various kinds of coal used at Teplitz according to their composition and quality. By nut is meant the coal in which the smallest pieces have a content of ¼ c. cm., the largest a content of 36 c. cm. The next smallest kind is called *lösche*, and it contains all that is smaller than nut coal, as well as all the dust that is gathered from the sorting of the coal. After nut coal, the largest is Nuttel coal No. 2, which contains pieces of over 36 c. cm. to something under the size of a man's fist. Nuttel coal No. 1 contains only pieces of the size of a man's fist and over. The spiegel is heated in a furnace resembling a welding furnace, which ends in a *fuchs*. The *fuchs* leads into a tower of a square section, in which there are several shelves, one above another on opposite sides, and inclining toward each other, on which the lime is placed. The tower terminates at the top in a fire-brick chimney. Directly in the lower part of the chimney the lime is introduced through a side opening, which leads downward from one shelf to another toward the bottom, and finally covers the whole, so that the surplus heat must rise through the different layers of lime.

As Teplitz does not prepare its own lime, but procures it already burnt, it happens that there is often a great deal of fine-slaked lime, in order to prevent which from adhering to the shelves, and thereby diminishing the draft of the furnace, vertical openings are provided in the sides of the tower, through which the surplus heat escapes, if the lime does not allow sufficient scope for this purpose, so that the due amount of draft required for the heating of the spiegel is not wanting. It will be easily understood that in the latter case the lime is not so fully heated as it should be. This arrangement of heating the spiegel and the lime at the same time has given very satisfactory results. A charge of 6½ tons of pig iron, the usual charge for rail steel, requires an addition of 370 kg. of speigel and 600 kg. of lime.

The most important use of brown coal is that of smelting the pig iron, for which at Teplitz the Siemens gas regenerative furnace is employed. The usual charge in this furnace amounts to 6½ tons of pig iron. The length of the furnace is 12.5 feet; the breadth, 6.5 feet; the extent of the surface available for the bath covers the full breadth of the furnace hearth; but the length is only 9.8 feet, the greatest depth in the center of the furnace being about 1 foot.

The gas and air chambers are arranged underneath the furnace hearth, thus giving upright generators. The cubical contents of a single air chamber is 547 cubic feet, and those of a single gas chamber .05 cubic feet. For the reversing valve generally cast iron cross-valves are employed. Such a furnace melts in two hours a charge of the proportions already described, so that eight charges in 24 hours can easily be obtained, including casting and re-charging. With these furnaces, by the acid process, and with iron tolerably rich in silicon, and with 50 per cent. steel scrap added, the time occupied in heating a charge was not longer, and the iron ran exceedingly hot from the furnace. The fuel used to raise the heat in this case is also nut coal, but there are two methods of applying the fuel. The gas generators of the old furnaces have generally grate bars, while the newer generators are fitted with the step-grates. With the latter it was intended to use nut coal No. 2, which is produced in some districts, and which is between the *lösche* and nut coal No. 1. The nut coal used with the flat grate bars was liable to fall through, whereas with the step-grates (*treppenröste*) excellent results are obtained.

Endeavors have been made to get up the necessary heat with slack (*lösche*) with the step-grates, and in this direction considerable success was obtained, but the production was sensibly diminished, and for this reason the use of slack has been abandoned. The total extent of grate-bar surface in one furnace is from 5 to 8 square meters (1 square meter = 10¾ square feet). The layer of fuel has, with the generators with the glut-grates (*planröste*), a medium hight of 2.6 feet meters, while with the step-grate generators the corresponding thickness is 1.7 feet meters. The gas collected from the generators is conveyed to a reservoir constructed of sheet iron, which is open toward the bottom, and stands in a cast iron water basin, wherein a great part of the tar, water and flue dust is allowed to fall. In consequence of the large quantity of water contained in the Bohemian brown coal, such an arrangement for condensation is regarded as necessary. The gas is conveyed direct from the connecting-basin to the gas valve, and the draft is so regulated that the gas in the furnace has a pressure of under one atmosphere, so that the flames are never allowed to appear outside the inspection holes of the furnace, while, on the other hand, air is drawn in from the outside. The furnace is supplied with a very strong draft, which enables the best result to be obtained. If the gas is allowed a pressure, as is the case so generally in the Siemens furnace, it not only does the work of smelting more slowly, but it also threatens to attack the chamber.

These furnaces require for 100 kg. of iron 45 kg. of nut coal. The smelting chamber is in all parts constructed with Dinas bricks, and the fire-bridges are kept in order during the working of the furnaces as required, loss of time from stoppages being as far as possible avoided. In the same way the side walls of the furnace are repaired. Each furnace will last about 600 charges, but after that time the hearth has become so broken up that a complete and thorough running out of the furnace cannot with safety be attempted. It is therefore preferred, after the the furnace has stood about 600 charges—that is, after three months of regular wear—to construct a new furnace. In order to heat the iron with advantage it is necessary to provide a chimney of 4.9 feet diameter and 147½ feet high for every two furnaces. According to character of the heating furnace, the iron heated with brown coal in the Siemens furnace undergoes some change in its chemical composition. Formerly, while the acid process was in use, one description of iron, introduced into the furnace with about 2.5 per cent. of silicon, was found, after being melted, to have its content of silicon reduced to 2.25 per cent., so that there was a considerable variation in the silicon content. With the basic process the content of manganese is varied in a much greater degree, one kind of iron, which, before being melted, contains 2 per cent. of manganese, showing a content of not more than 0.6 as it runs from the furnace.

It may finally be remarked that the total quantity of steam required to be raised on the works is obtained from brown coal, and for this purpose only slack (*lösche*) is employed. In the consumption of this fuel, Bolsano's patent shelf-grates are used in part, and partly step-grates (*treppenröste*), either system being found equally successful. The Teplitz works require for the carrying out of the Thomas process about 20 charges of 6 to 6½ tons daily, about 1320 c. m. of brown coal, and 1.6 c. m. of coke, so that the quantity of coke required is only 0.1 per cent. of the total fuel employed.

The Production of Pig Iron in Germany.—A German exchange records the fact that the iron works at Peine, Hanover, have attained the highest rate of production yet known upon the Continent of Europe. The average daily production of a furnace has increased from 75 tons in the year 1870 to 135 tons at the present time. The establishment in question has three blast furnaces, each of a capacity of about 10,600 cubic feet, in which six different varieties of iron ore are smelted, the yield of iron being about 35¾ per cent. The ore is for the most part taken from the immense deposits of oölitic iron ore in the vicinity, which commence very near the surface of the ground, and, consequently, present no great difficulties in mining. The quantity of coke consumed is stated to be about 93 per cent. of the yield of pig iron, and, owing to the proportion of manganese which it contains, the iron produced at this establishment is preferred to that made at Luxembourg and Lorraine for several purposes.

Extraction of Gases from Molten Metals.

The extraction of gases from molten iron, steel, slag and other metals and materials has always been attended by some interest, and various methods have been advocated from time to time with the view of giving satisfactory results in the direction here indicated. Among these we would mention that of Russell Aitken, of London, England, who, in order to attain the end aimed at, causes the molten metal or other material to enter or pass through a vacuum, or partial vacuum, in the form of a thin stream or spray, and the apparatus in which he conducts his operation may be briefly described as follows: A ladle is closed air-tight and provided with a connection to a pump or exhauster, by means of which a partial vacuum may be created. Communicating with the interior of this ladle is another receptacle, and the passage between the two is closed by a valve or plug capable of being raised or lowered by a lever or some other attachment extending to a position outside, so as to be readily accessible. The valve or plug in question being closed and a vacuum being formed in the ladle, the molten material is poured into the receiver, from which it is gradually allowed to pass into the vacuum chamber by easing the valve or plug.

The molten metal then falls into the vacuum chamber in a thin stream, and owing to the absence of pressure the gases inclosed in the molten metal may readily escape, and by allowing the material to strike against a projection the metal may be broken up into a number of small streams, thus greatly facilitating the action. The latter are drawn off from the chamber in question by the exhauster or pump, which is kept at work. The vessel in which the vacuum is formed may be of any inverted syphon-like form at the bottom, so that the metal as it accumulates passes off by the turned up end. In a modification of the apparatus suited for treating molten substances of a comparatively low specific gravity, the receiver containing the molten substance is placed at the side of or beneath the vessel in which the vacuum is maintained, and is connected with it by a pipe through which the molten material is forced by the great external pressure

LABOR AND WAGES.

Notices were posted at the steel mills in Scranton, on Wednesday the 22d, of a general reduction of wages, to take place on the 1st prox. No resistance to the reduction, which it is thought will be 10 per cent., is anticipated, the cutting down being made in order to keep the mills running through the winter.

At the monthly meeting of the various rolling mills in Philadelphia, held on November 20th, the price of iron was fixed for the month at 2 5-10ths cents per pound, a reduction from the last fixed rate in February last of 2-10ths of a cent. According to the schedule of wages agreed upon in 1878, between the manufacturers and workmen, the reduced price of iron brings the workmen's wages down as follows: Heater, from 70½ cents per ton to 66½; helper, from 35¼ to 33¼; roller, from 39½ to 37½; roughers, from 23 to 22; catcher, from 18½ to 17½; saw boy, from 9 to 8½; screw boy, from 9 to 8½; straightener, from 18½ to 17½; hook-up, from 10 to 9½; buggy man, from 18½ to 17½; stocker, from 18½ to 17½. This reduction will go into effect on the first Monday in December. Several of the manufacturers express little doubt but that the reduction will be quietly submitted to by the men.

The pipe cutters at the Reading Iron Works have quit work on account of a reduction in wages, and the tube works are idle. The strike will probably not last very long.

Steel for Nail Making.—A great many attempts have been made to introduce the use of steel as a material for nail making. We believe that at one time a great many steel nails were made at Troy, but for various reasons none are made now. A company has just been organized in Wheeling, however, consisting of most of the prominent nail mills in that neighborhood, for putting up a Bessemer plant for making steel for nails. The title of the new company is the Wheeling Steel Company, and the purposes for which it is organized, as set forth in the charter, is for the manufacture of steel and iron in all their forms, mining, transportation and all other things needful to carry on the iron and steel manufacturing business. The capital stock is $1,000,000, and the incorporators are as follows: J. N. Vance, representing the Riverside Iron and Nail Company; A. Wilson Kelly, of the Belmont Nail Works; W. H. Wallace, of the Jefferson Iron Works, of Steubenville; J. R. McCartney, of the Bellaire Nail Works; C. D. Hubbard, of the Wheeling Iron and Nail Works; L. K. Wallace, of the La Belle Nail Works, and Alonzo Loring, of the Benwood Iron Company. The new company proposes to break ground at once for the erection of one of the largest works in the West, and push the work of construction energetically to completion.

The large helve hammer used by the New Albany Steam Forge, at New Albany, Ind., in the manufacture of steamboat shafts and cranks, is at present engaged in making one of the largest shafts ever made in the West. The shaft will be 33½ feet long and 15½ inches in diameter, and will weigh, exclusive of cranks and flanges, about 24,000 pounds.

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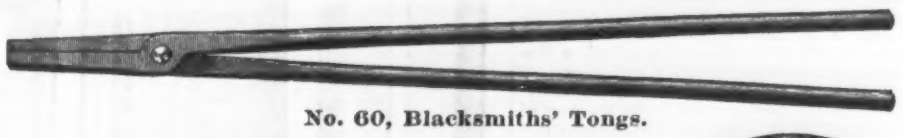

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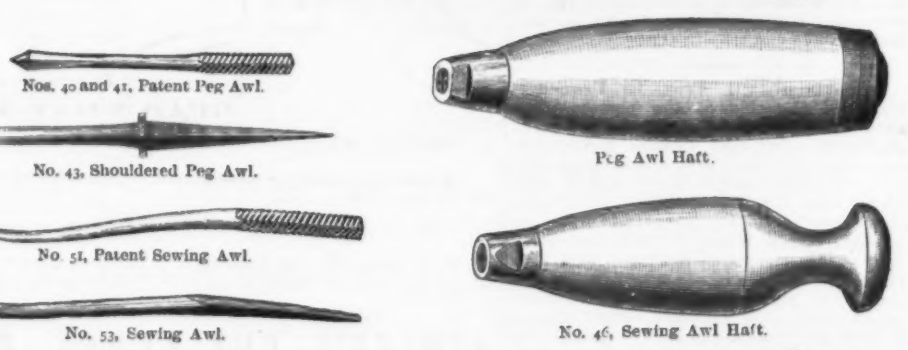

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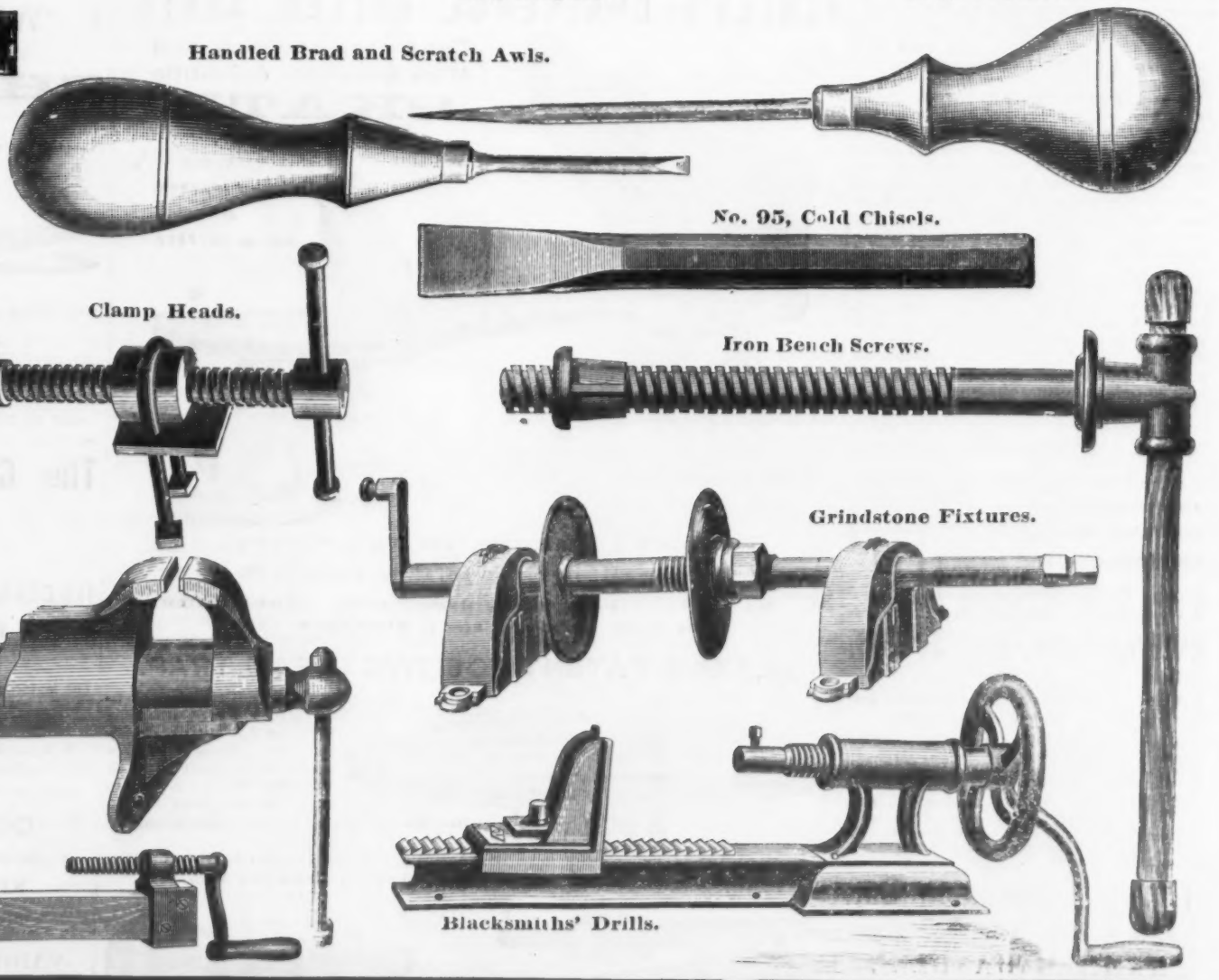

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TRADE PUBLICATION.

The Ellithorpe Patent Safety Air Cushion Company.

We have received from the above company one of their catalogues, setting forth the advantages of their patent safety air-cushions and air-brakes for elevators. The frequent occurrence of elevator accidents has, within the past few years, given rise to the introduction of numerous appliances tending to remove the dangers attending the use of elevators, and among these, it would seem, the air-cushions and air-brakes placed upon the market by the above company occupy a prominent position. The manufacturers, in their catalogue, submit a few brief remarks about the uses and abuses of elevators, the remaining pages of the publication being devoted to a large number of extracts from the columns of different newspapers, illustrating the advantages of their appliances. A list of prominent buildings where the safety air-cushion is now in use is also given, the whole forming quite an extensive collection of testimonials and flattering tributes favoring the adoption of the apparatus considered.

Engineering Enterprise in Hamburg.—The Senate of Hamburg, Germany, as recently reported in an exchange, have had under consideration a scheme for constructing a tunnel under the Elbe, and an elevated railway in the city. The construction of a bridge instead of a tunnel is said to be out of the question on account of the width and crowded state of the harbor, and the author of the project, Mr. Westendorp, has designed the tunnel of such dimensions as would provide both for vehicles and foot passengers, and a double-track railway for freight and passengers. This he proposes to effect by building the tunnel of two stories, the road for vehicles and pedestrians to be in the upper story, and the line of railway in the lower story. The crown of the tunnel for a length of 656 feet (the width of the navigable channel of the Elbe) is to be from 20 to 30 feet below low-water mark, and separate openings are to be provided for railway and roadway, the ascent to be very gradual, about 1 in 35. The tunnel is to be an iron cylinder lined with brickwork, the upper story resting upon columns placed between the two lines of rails. The latter would be in continuation of the track of the elevated railway in the city, which is to be of a decorative ironwork, and similar to that of the elevated roads of this city. Three stations will be provided at different points, where pavilions are to be erected for taking up and putting down passengers. The tunnel is to lighted by electricity, and ventilated and drained by powerful machinery, and provisions are also to be made for taking gas and water pipes, telegraph and telephone wires, &c., through it. The estimated cost of the tunnel and railway is 26,000,000 marks, or about $6,250,000, and they are to be completed in five and a half years.

Imports of Pig Iron to France.—Statistics available at the present time show that the imports of pig iron to France during the first nine months of the year amounted to 204,483 tons, as compared with 204,376 in the corresponding period of 1881. The entries duty free fell from 63,627 tons in 1881 to 46,740 in 1882, while those on which the duties were paid reached a total of 157,743 tons, as against 140,749 in 1881. As far as finished iron is concerned, it appears that 107,157 tons entered the country, as compared with 67,982 last year. The iron wire branch also was more active, the entries being set down at 6552 tons, against 3863 in 1881. The steel imports progressed from 14,037 tons to 32,369 tons, the chief improvement being in rails, which rose from 3804 to 19,938 tons, and rough tires, from 1222 to 3444 tons. Sheets declined from 863 to 471 tons, while steel wire rose from 270 to 333 tons. The exports of pig iron fell from 8061 to 6190 tons; bar iron, from 911 to 861 tons, and sheets, from 716 to 566 tons. On the other hand, those of rails advanced from 52 to 100 tons, and wire, from 363 to 392. Steel bars were exported to the amount of 503 tons, as against 460 in 1881, and rails to the extent of 103 tons, instead of 13. The total imports of ore are set down at 1,062,481 tons, as compared with 982,996 in 1881, and 892,328 in 1880. The exports were 85,205, as against 61,703 in 1881 and 85,352 in 1880. The entries of machinery to the country during the period under review represented a value of 62,000,000 francs, as compared with 47,000,000 in the corresponding period of last year, while the ships' plates, &c., brought to France are valued at 40,850,000 francs, as contrasting with 16,530,000 francs in 1881.

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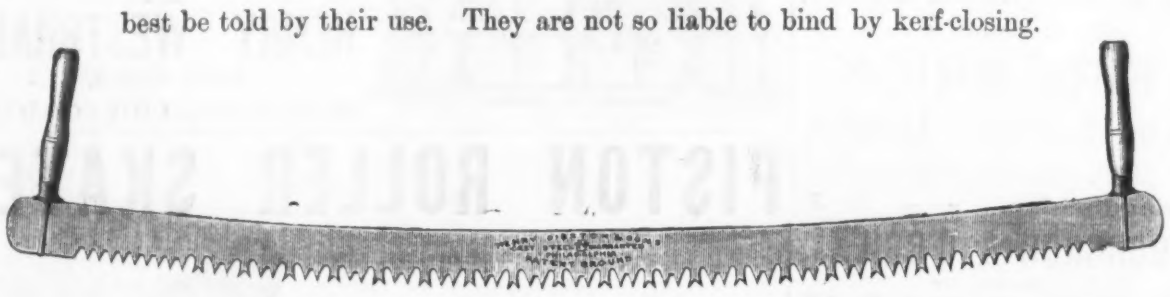

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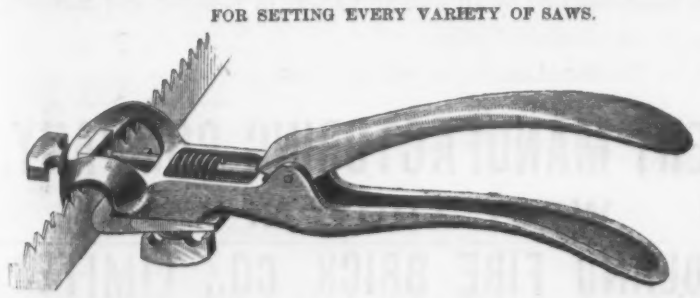

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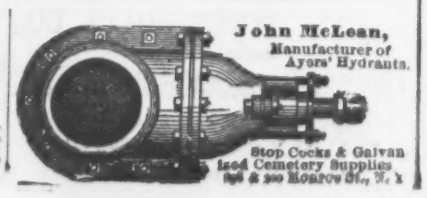

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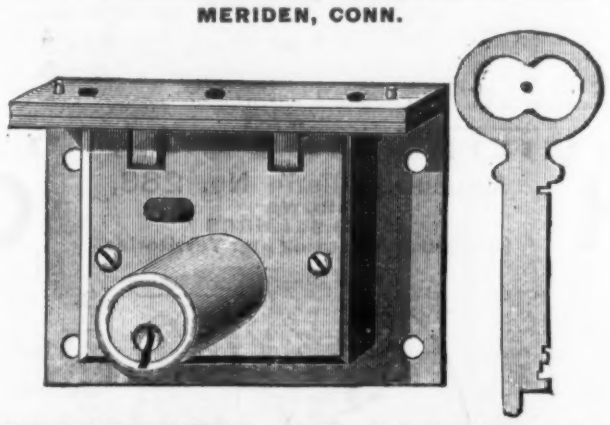

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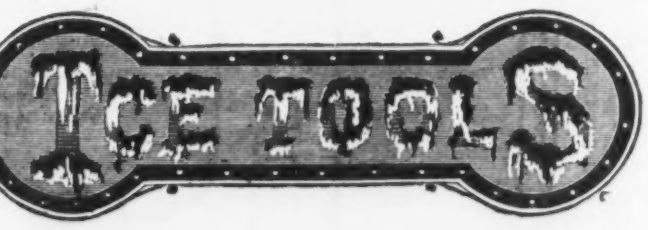

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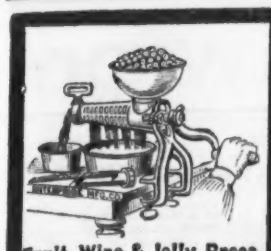

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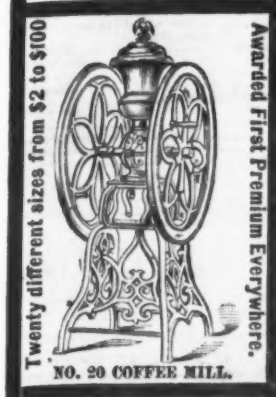

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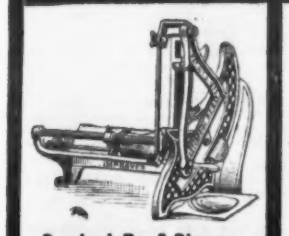
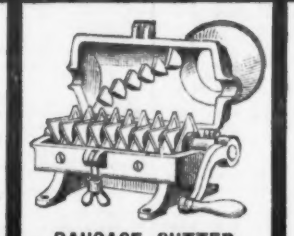
CHEAPEST.

SOLD BY HARDWARE DEALERS.
SEND FOR ILLUSTRATED CATALOGUE, FREE.



Smoked Beef Shaver.



SAUSAGE CUTTER.

Bung Hole Borer.

Tobacco & Root Cutter.

THE STANLEY WORKS,

MANUFACTURERS OF

Wrought Iron Butts, Hinges

AND

DOOR BOLTS,

Plain, Japanned, Bronzed and Plated.

FACTORIES: New Britain, Connecticut.

WAREHOUSE: 79 Chambers St., New York.

Having bought out entire Machinery of the Star Tool Co, we are now prepared to supply the Trade with a full line of

STAR TRY SQUARES, RULES, &c.

First Class goods in every respect. None but best stock used. Send for Circular and Price List.

REED & CO., Higganum, Conn.

Sole Manufacturers Star Goods.

For Sale by C. E. JENNINGS & CO., 96 Chambers St., N. Y.

Bemis & Call Hardware & Tool Co.

This Wrench can be furnished with Briggs' Pat. Nut or Sleeve.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench thus making a combination which has no equal.

For Circulars and Price List, address

BEMIS & CALL HARDWARE & TOOL COMPANY. Springfield, Mass.

HOLIDAY GOODS.

SHOO FLY

ROCKERS.

For Circulars and Price List of Wagons, Gas pipe and Steel Sleds, Shoo Fly Rockers, Toy and Boy Wheelbarrows, Boy Tricycles and Bicycles, Child's Velocipedes, Gents' Tricycles, &c., &c., &c. Address

THE TRICYCLE MFG. CO,

Springfield, Ohio, U. S. A.

OHIO STEEL BARB FENCE CO.

FOOT OF CASE AVE., CLEVELAND, OHIO.

EASTERN OFFICE, 117 JOHN ST., NEW YORK CITY, U. S. A.

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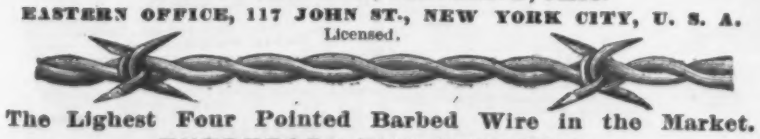

The Lighest Four Pointed Barbed Wire in the Market.

THEREFORE THE CHEAPEST.

Orders from Eastern markets and Seaboard promptly filled from stock in New York City. Samples and Circulars furnished on Application.

J. E. QUACKENBUSH & SON

MANUFACTURERS OF

Porcelain, Mineral & Jet Knobs & Escutcheons.

Send for Price List and Terms

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The "Eureka" Pipe Cutter

THE BODY—is fitted with an adjustable Cast-Steel Jaw at the point where it comes in contact with the Pipe, which Jaw can be renewed at any time by simply removing one screw. By this system the wearing away of the Jaw (which in other cutters is the first part to give out) is effectually prevented, and this tool can be kept in first-class order at all times.

THE WHEEL BLOCK.—This is also of Steel, neatly fitted to its socket and cannot be dropped out. It is much more durable than the cast-iron blocks and is hardened at the point where the rod comes in contact with it.

THE HANDLE—of this Cutter is put on to stay, and cannot be removed by the roughest usage, as it is an iron handle, cast fast to the Rod, operating the block.

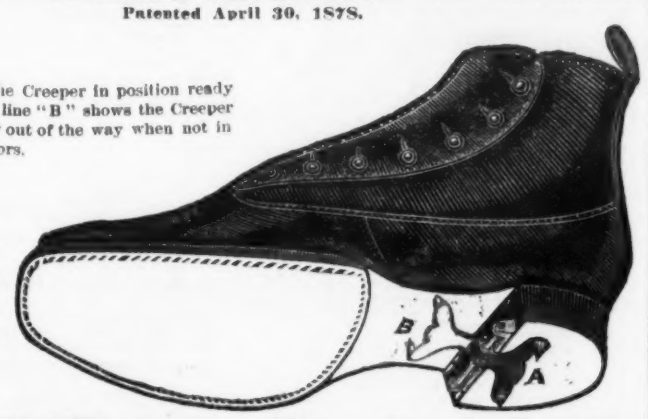
—MANUFACTURED BY—

Pancoast and Maule 243 & 245 SOUTH THIRD STREET PHILADA.

IMPROVED "CLIMAX" REVERSIBLE ICE CREEPER.

Patented April 30, 1878.

"A" represents the Creeper in position ready for use. The dotted line "B" shows the Creeper thrown back entirely out of the way when not in use, or walking indoors.



We offer to the Trade this season this favorite Creeper greatly improved.

CHILDS, GROFF & CO., Mfrs., Cleveland, Ohio.

ALSO FOR SALE BY

BIDDLE HARDWARE CO., Philadelphia. PECK & SNYDER, New York. J. P. PHINNEY & CO., Boston.
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HANDLES FOR MANUFACTURERS.

From Selected Stock, Thoroughly Seasoned, Well Made.

Orders solicited from close buyers who want good work.

RIPLEY MANUFACTURING CO.,

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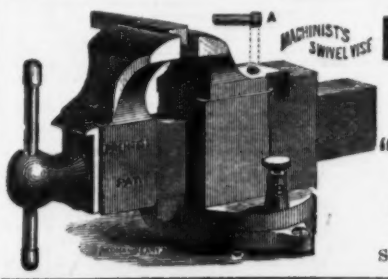
Manufacturers of

"Common Sense" Mouse Traps, Mallets, Porcelain-Lined Lemon Squeezers, Boot Jacks, Faucets and Hardware.



PRENTISS' PAT. VISES,

Adjustable Jaw.

Stationary or Pat. Swivel Bottoms.

ADAPTED TO ALL KINDS OF VISE WORK. ALSO

"PEERLESS" SWIVEL PIPE GRIP,

FITS ANY VISE. SOLD BY THE TRADE.

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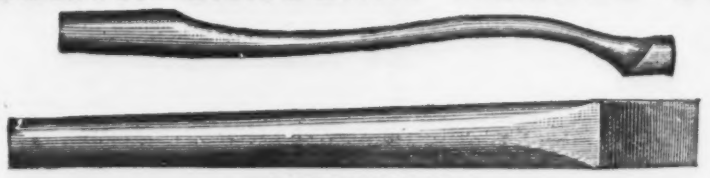

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HARDWARE COMMISSION MERCHANT.

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MANUFACTURERS OF

Horse, Mule & Snow Shoes of the Perkins Pattern.

Works at Valley Falls, R. I. Office, 31 Exchange Place, Providence, R. I.

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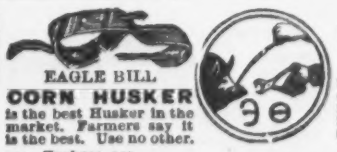
CHAMPION
HOG RINGER
RINGS and HOLDER.

Only double Ring ever invented. The only Ring that will effectually keep Hogs from rooting. No sharp points in the nose.

EAGLE BILL
CORN HUSKER
is the best Husker in the market. Farmers say it is the best. Use no other.



BROWN'S
HOG AND PIG
RINGER and RINGS.

Only single Ring in the market that closes on the outside of the nose. No sharp points in the nose to keep it sure.

Ringers 75c. Rings, 50c. 100. Holders, 75c. Huskers, 150.

CHAMBERS, BERING & QUINLAN, Exclusive Manufacturers, Decatur, Ill.

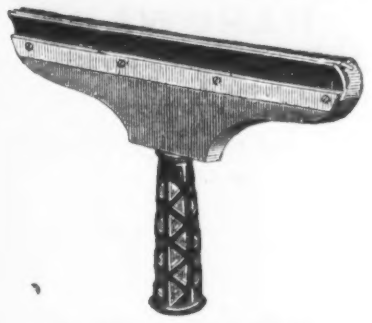
BUTLER & GOLDEY MFG. CO., Limited,

MANUFACTURERS OF

Hardware and Machinist Tools,

Factory, ARLINGTON, N. J., P. O. Box 1909. Office, 97 Chambers St., NEW YORK.

PERFECTION WINDOW CLEANER.



To the Jobbing Trade.

We wish to call the attention of jobbers in Hardware, Woodenware and Housefurnishing trades to the

ACKNOWLEDGED MERIT

OF OUR

Window Cleaners.

They will find them very saleable, with a demand that is constantly increasing. We should be pleased to have a trial order.

VERY LIBERAL DISCOUNTS.

CAUTION.—We own all the patents covering rubber devices for cleaning windows, and will promptly prosecute parties infringing.

The genuine have two rubbers, metallic strip, open hollow iron handle, with P. W. C. Co. cast in face; name, date of patents and copyrighted directions.

PERFECTION WINDOW CLEANER CO.,

232 La Salle St., CHICAGO, ILL.

SCROLL SAWS,

The "Challenge" and "Rival" are the finest foot-power Scroll Saws in the world, with or without Lathe attachment.

Price, $10 to $20.

New Catalogue free. Address

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Grindstones, Emery, &c.

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Berea, O., Nova Scotia, & other brands

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GEO. CHASE,

The largest manufacturers in the world of

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STONE

Of all description.

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OHIO GRINDSTONE COMPANY,

H. H. CLOUGH, Prest. J. M. WORTHINGTON, Secy
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Manufacturers of

GRINDSTONES

Of All Kinds.

127 Superior Street,

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LOMBARD & CO.,

Importe and Dealers in all kinds of

GRINDSTONES,

Cor. Lewis Wharf & Atlantic Ave., Boston.

Stones for Machinists, Carpenters, Farmers and Glass Cutters constantly on hand and cut to order.

New York Wholesale Prices, November 29, 1882.

HARDWARE.

Anvils.
Eagle Anvils American.......₩ lb 10c—dis 20 %
Wright's.......11c @ 11¼c
Armitage's Mouse Hole.......9½c @ 9¾c
Trenton.......10¾c
Wilkinson's.......10½c

Anvil Vise and Drill.
Millers Falls Co., $18.00.......dis 20 %
Cheney Anvil and Vise.......dis 25&2 %

Augers and Bits.
Conn. Valley Mfg. Co.
Douglass Mfg. Co.
C. E. Jennings & Co.
Humphreysville Mfg. Co.
Ives
Beecher (French, Swift & Co.
Griswold
Nobles Mfg. Co.
Snell Mfg. } dis 40&10 % from list of Jan. 7, 1880.
Watrous & Co. Extension Lip.......dis 35 %
Cook's Douglass Mfg. Co.......dis 40&10 %
Patent Solid Head.......dis 30 %
Lewis' Patent Single Twist.......dis 40 %
Russell Jennings' Auger, Dowel, Machine-Dowel and Hand Rail Bits.......dis 10&10&10 %
Russell Jennings' Augers.......dis 16⅔&10&10&10 %
Russell Jennings' Car and Machine Bits, Boring-Machine and Millwrights' Augers.......dis 25&10&10&10 %
Imitation Jennings' Bits.......dis 45 %
Ives' "Jennings" Bitts.......dis 33⅓&10 %
Snell Mfg. Co.'s Jennings' Bits.......dis 40 %
Andrews' Bits.......dis 40 %
Expansive Bits, Clark's, small, $18; large, $26..dis 25 %
Expansive Bits, Ives'.......$20 @ $30—dis 33⅓ %
Expansive Bits, Blake's.......$20—dis 40 %
Expansive Bits, Parmelee's.......$20 & $30—dis 33⅓ %
Expansive Bits, Derby, $17 and $26.......dis 40 %
Hollow Augers, Ives.
Hollow Augers, French, Swift & Co. } dis 25 %
Hollow Augers, Douglass'.......25 %
Hollow Augers, Bonney's Adjust. ₩ dz. $48—dis 25&10 %
Hollow Augers, Stearns' Adjust. ₩ dz. $48—dis 20&10 %
Hollow Augers, Ives' Expansive, each $4.50—dis 30&10 %
Hollow Augers, Universal Expan., each $4.50—dis 20 %
Wood's.......dis 25 %
Gimlet Bits.......$7.50 ₩ gross, dis 20 %
Gimlet Bits, Diamond.......₩ doz. $1.10, dis 25&10 %
Gimlet Bits "Bee".......dis 25 %
Double Cut Gimlet Bits, Shepardson's.......dis 40 %
Double Cut Gimlet Bits, Ct. Valley Mfg. Co. dis 30&10 %
Double Cut Gimlet Bits, Hartwell's.......dis 60 %
Double Cut Gimlet Bits, Douglass'.......dis 40 %
Double Cut Gimlet Bits, Ives'.......dis 50 %
Morse's Bit Stock Drill.......dis 25 %
L'Hommedieu's Ship Augers.......dis 15 %

Awl Hafts.
Sewing, Brass Ferrule.......$3.50 ₩ gross—dis 40&10 %
Patent Sewing, Short.......$1 00 ₩ doz.—dis 40&10 %
Patent Sewing, Long.......$1.20 ₩ doz.—net
Patent Peg, Plain Top.......$10.00 ₩ gross—dis 40&10 %
Patent Peg, Leather Top.......$12.00 ₩ gross—dis 40&10 %

Awls, Brad Sets, &c.
Awls, Sewing, Common.......₩ gross $1.70—dis 25&10 %
Awls, Shouldered Peg.......₩ gross $2.45—dis 25&10 %
Awls, Patent Peg.......₩ gross 62c—dis 25&10 %
Awls, Shouldered Brad.......₩ gross $2.70—dis 25&10 %
Awls, Handled Brad.......$7.00 ₩ gross—dis 25&10 %
Awls, Handled Scratch.......$7.00 ₩ gross—dis 25&10 %
Awls, Socket Scratch.......$1.50 ₩ gross—dis 10&10 %
Brad Sets, Aiken's.......₩ doz $12.00—dis 45&10 %
Brad Sets, No. 42, $10.50; No. 43, $12.50.......dis 70 %
Brad Sets, Stanley's Excelsior, No. 1, $9.60...dis 30&10 %
Brad Sets, Stanley's Excelsior, No. 2, $4.80...dis 30&10 %
Brad Sets, Stanley's Excelsior, No. 3, $7.80...dis 30&10 %

Axes.
Single Bit, 4½ to 5½ and under.......₩ doz 9.00 net
Single Bit, 4½ to 6 and over.......₩ doz $9.50 net
Single Bit, beveled.......50c ₩ doz advance
Double Bit, 4½ to 5½ and under.......₩ doz $19.00 net
Double Bit, 4½ to 6 and over.......₩ doz $20.00 net
Double Bit, beveled.......$1.00 ₩ doz advance

Axle Grease.
Fraser's.......₩ lb 6c

Axles.
Standard list.......dis 45 %

Bag Holders.
Sprengle's Patent, ₩ doz $18.......dis 40 %

Balances.
Spring Balances.......dis 15&10 %

Bells.
Hand, Light Brass.......dis 65&10 %
Hand, Extra Heavy.......dis 45 %
Hand, White Metal.......dis 60 %
Hand, Silver Chime.......dis 20&10 %
Hand, Globe (Cone's Patent).......dis 25&10 %
Gong, Abbe's.......dis 20&10 %
Gong, Yankee.......dis 30&10 %
Gong, Barton's.......dis 30&10 %
Crank, Taylor's.......dis 25&10 %
Crank, Brooks'.......dis 50&10&2 %
Crank, Cone's.......dis 10 %
Crank, Connel's.......dis 10 %
Lever, Sargent's.......dis 55&10 %
Lever, Taylor's Bronzed or Plated.......net
Lever, Taylor's Japanned.......dis 25&10 %
Lever, R. & E. M. Co.'s.......dis 45&10&2 %
Lever, Reading.......dis 25&10&10 %
Pull, Brook's.......dis 50&10&2 %
Pull, Western.......dis 25&10 %
Call.......dis 25 %
Cow, Common Wrought.......dis 55&10 %
Cow, Western.......dis 20&10 %
Cow, Western, Sargent's list.......dis 55&10 %
Cow, Kentucky "Star".......dis 20&10 %
Cow, Kentucky Sargent's list.......dis 55&10 %
Cow, Dodge's Genuine Kentucky, new list—
Nos. 0 1 1½ 2 3 4 5 6 Hog
$12.00 10.00 9.00 8.00 7.00 5.00 3.50 2.50 5.00 } dis 60 %
Cow, Texas "Star".......dis 40 %

Bellows.
Blacksmiths' Common.......dis 45 %
Blacksmiths' Extra Pittsburgh Pattern.......dis 20 %
Molders'.......dis 25 %
Hand Bellows.......dis 20 %

Belting, Rubber.
Belting and Packing Co.......dis 50 %

Bit Holders.
Extension, Barber's.......₩ doz $15.00—dis 40&5 %
Extension, Ives'.......₩ doz $15.00—dis 40 %
Diagonal.......₩ doz $24.00—dis 40 %
Angular.......₩ doz $24.00—dis 40&5 %

Blind Adjusters.—Domestic..₩ doz $3.00—dis 15 %
Excelsior.......₩ doz $16.00—dis 50&10&2 %

Blind Fasteners.
Mackrell's.......₩ doz pairs, $1.00 dis 10 %
Van Sand's Screw Pattern.......$9 ₩ gro. net
Van Sand's Old Pattern... 1¼, $8; 1½, $8.50; ₩ gro. net
Washburn's Old Pattern.......$9 ₩ gro. net
Merriman's.......new list, net
Salisbury & Austin, No. 2008.......$9 per gro. net
Security Gravity.......$9 per gross. net

Blind Staples.
Bar bed, ⅜ in. and larger.......₩ lb 11c net
Bar bed ⅝ in.......₩ lb 13c net

Blocks.
Penfield Block Co., I. R. and I. Strap'd...dis 35 %
Penfield Block Co., W. I. C. bushed.......dis 35 %
Penfield Block Co., W. I. all steel roll'r..dis 20 %
Penfield Block Co., L. & I Sheaves.......dis 35 % } New List.
Stanley Rule & Level Co.'s.......dis 40&10 %

Bolts.
Cast Iron Barrel Shutter, &c.......dis 55&10 %
Cast Iron Chain (Sargent's list).......dis 60&10 %
Ives' Patent Door Bolts.......dis 50 %
Wrought Barrel.......dis 55&10 %
Wrought Square.......dis 55&10 %
Wrought Shutter, all Iron, Stanley's list.......dis 50&10 %
Wrought Shutter, Brass Knob, Stanley's list.dis 50&10 %
Wrought Shutter, Sargent's list.......dis 55&10 %
Wrought Sunk Flush, Sargent's.......dis 60&10&10 %
Wrought Sunk Flush, Stanley's.......dis 40&10 %
Wrought B. K. Flush, Com'n Stanley's.......dis 55&2½ %
Carriage and Tire, Common.......dis 80 %
Carriage and Tire, Philadelphia. new list.......dis 65 %
Carriage and Tire, Philadelphia Pattern.......dis 70 %
Union Carriage.......dis 70 %
R. B. & W. Carriage (old list).......dis 65 %
Tire, Am. Screw Co.'s, Phila.......dis 75 %
Tire, "Bay State".......dis 80&10 %
Tire, R. B. & W., new list.......dis 70&10 %
Stove—American Screw Co.'s.......dis 40 %
Stove, R. B. & W.......dis 40 %
Stove, R. & E. Mfg. Co.......dis 40 %
Plow.......dis 50 %
Plow, R. B. & Co.......dis 40 %
Machine.......dis 65 %
Bolt Ends.......dis 60 %

Borax........16c ₩ lb net

Boring Machines. Upright Angular
First quality, no Augers.......$5.50 $6.75..dis 45 %
Phillips, with Augers.......7.00 7.50.......net
Jennings & Co., no Augers.......5.50 6.75..dis 40 %

Boxes.
Interchangeable Shelf Boxes.......dis 20 %

Braces.
Q. S. Backus.......dis 50 %
Wilson Mfg. Co.......dis 10 %
Barber's.......dis 40&5 %
Spofford's Patent.......dis 50&5 %
Ives' Patent Braces.......dis 50&10 %
Common Ball (American).......dis 55 %
Amidon's.......dis 50 %
Barker's Imp'd.......dis 10 %
Empire.......dis 30 %
Buffalo Ball.......dis 40 %

Brackets.
Shelf, plain.......dis 50&10 %
Shelf, fancy.......dis 55&10 %
Reading.......dis 55&10 %

Bright Wire Goods list of Dec. 15, '79..dis 55&10 %

Bull Rings.
Union Nut Co.......dis 55 %
Sargent's.......dis 60&5 %
Hotchkiss' low list.......dis 15 %
Humason, Beckley & Co.'s.......dis 55&5 %

Butts.
Wrought Brass.......dis 65&10 %
Cast Brass, Tiebout's.......dis 33⅓ %
Cast Brass, Corbin's Fast Joint.......dis 20&10 %
Cast Brass, Loose Joint.......dis 10&10 %
Fast Joint, Narrow.......dis 45&10 %
Fast Joint, Broad.......dis 45&10 %
Loose Joint.......dis 55&10 %
Loose Joint, Japanned.......dis 55&10 %
Loose Joint, Japanned with Acorns.......dis 55&10 %
Parliament Butts.......dis 55&10 %
Mayer's Hinges.......dis 60&10 %
Loose Pin, no Acorn.......dis 50&10 %
Loose Pin, Acorns.......dis 50&10 %
Loose Pin, Acorns, Japanned.......dis 60&10 %
Loose Pin, Acorns, Japanned, Plated Tips..dis 60&10 %

WROUGHT IRON.
Fast Joint, Narrow.......dis 40&10 %
Fast Joint, Lt. Narrow.......dis 40&10 %
Fast Joint, Broad.......dis 40&10 %
Loose Joint, Broad.......dis 45&10 %
Table Butts, Back Flaps, &c.......dis 40&10 %
Inside Blind Regular.......dis 40&10 %
Inside Blind, Light.......dis 40&10 %
Loose Pin, Wrt.......dis 45&10 %
Loose Pin, Light.......dis 40&10 %
Spring Hinges:
Geer's Spring and Blank Butts.......dis 25 %
Sabin Mfg. Co.'s Double Acting.......dis 35 %
Union Spiral Spring, Japanned.......dis 25 %
Union Spiral Spring, Ornamental.......dis 20 %
Union Spring Hinge Co.'s.......dis 25 %
American Spring Hinge Co.'s.......dis 25 %
Gem Spring Hinges.......dis 25 %
Union Mfg. Co.......dis 25 %
Bommer's.......dis 25 %
Buckman's.......dis 25 %
Blind Butts Parker.......dis
Blind Butts, Palmer.......dis 45&10 %
Blind Butts, Seymour.......dis
Blind Butts, Shepard's "Double Locking," Nos. 1 & 2.......dis 70 %
Blind Butts, Lull & Porter.......dis 70&10 %
Blind Butts, Nicholson.......dis 45&10 %
Blind Butts, Huffer.......dis 60 %
Blind Butts, Clark's, Nos. 1, 3, 5.......dis 70 %
Blind Butts, Sargent's, Nos. 1, 3.......dis
Blind Butts, Sargent's, No. 12.......dis
Blind Butts, Reading's Gravity.......dis
Clark's Improved Shutter Hinge, Nos 0, 1, 1½, 2, 2½, 3.......dis 60&10 %

Bow Pins.
Humason, Beckley & Co.'s.......dis 55&5 %
Sargent & Co.'s.......$19.70 and $21.40, dis 60&10 %
Hotchkiss.......dis 25 %

Butcher's Cleavers.
Humason & Beckley Mfg. Co.......dis 25 %
Bradley's.......dis 25 %
Beatty's.......dis 25&5 %
1 2 3 4 5 6 7 8
$16.50 19.00 21.50 24.00 27.00 30.00 33.50 36 50

Can Openers.
Messenger's Comet.......₩ doz $3.00, dis 25 %
American.......₩ gross $7.50, dis 10 %
Duplex.......₩ doz 25c, dis 15@20 %
Lyman's.......₩ doz $3.75, dis 20 %
No. 4, French.......₩ doz $2.25, dis 55 %
No. 5, Iron Handle.......₩ gross $7 5?, dis 10 %
Eureka.......₩ doz $2.50, dis 10 %
Sardine Scissors.......₩ doz $7.00, dis 55 %
Star.......₩ doz $5.00, dis 25 %
Sprague, No. 1, $2.00; No. 2, $2.25; No. 3, $2.50.......dis 50&10 %
"Worlds Best" ₩ gross, No. 1. $12.00; No. 2, $24.00; No. 3, $30.00.......dis 50 & 10 %
Universal.......₩ doz $2.00, dis 35 %
Domestic.......₩ doz $2.50, dis 45 %
Champion.......₩ doz $2.00, dis 50 %

Caps—Percussion, ₩ 1000.
Hicks & Goldmark's
F. L. Waterproof, 1-10's.......50c
E. B. Trimmed Edge, 1-10's.......65c
E. B. Ground Tr'md Edge, Central Fire, 1-10's..70c
Pistol Waterproof, extra heavy, 1-10's.......$1.10
Musket Caps, 1-10's.......80c } dis 10&10
U. M. C., F. C. trimmed.......50c
U. M. C., F. L. ground.......70c } dis 10&10 %
U. M. C., Cen. fire ground.......70c
U. M. C., Double W. Proof.......$1.40 } dis 10&5 %
G. D. & S. B.......33c, dis 10 %
Double Waterproof, in 1-10's.......$1.40
Colt's Pistol, in 1-10's.......70c } dis 10 %
F. L.......50c
E. B. 1-10, trimmed.......65c
E. B. 1-10, ground edge.......70c } dis 10&5 %
Musket, in 1-10's.......80c, dis 10&10 %

Cartridges.—Rim.......dis 70&10 %
Central Fire.......dis 20&10 %

Cards.—Horse and Curry.new list, July, '81, dis 10 %
Cotton.......new list, July, '81, dis 10 %
Wool.......new list, July, '81, dis 10 %

Carpet Stretchers.
Cast Steel, Polished.......₩ doz $5.00, dis 30 %
Cast Iron, Steel Points.......₩ doz $2.00, dis 45 %
Bullard's.......dis 25 %

Casters.
Bed.......dis 35&10 %
Plate and Shallow Socket.......dis 35&10 %
Deep Socket.......dis 25&10 %
Martin's Patent (Phoenix).......dis 25 %

Cattle Leaders.
Humason, Beckley & Co.'s.......dis 60&10 %
Sargent's.......dis 60&10 %
Hotchkiss.......dis 25 %

Chain.
Trace, 6½-10-2.......₩ pair 79c
Trace, 6½-10-3.......₩ pair 70c
Trace, 7-10-2.......₩ pair 80c } dis 35 %
German Halter Chain, list of Dec. 31. 1881.......dis 50 %
German Coil, list of Dec. 31, 1881.......dis 50 %
Covert Halter, Hitching and Breast.......dis 35&5 %
Oneida Halter Chain (old list).......dis 45 %
Galvanized Pump Chain.......₩ lb 9½c net
Jack Chain, Iron.......dis 60&10 %
Jack Chain, Brass.......dis 50&10 %

Chalk.
White.......₩ gross 60c net
Red.......₩ gross 80c net
Blue.......₩ gross $1.00 net
White Crayons.......₩ gross 10c net

Chalk Lines.—See Lines

Chisels.
Socket Framing, Crossman.......dis 65&5 %
Socket Framing, Arlington Edge Tool Co.......dis 65&10 %
Socket Framing, Buck Bros.......1876 list, dis 22½ %
Socket Framing, Merrill.......dis 65&10 %
Socket Framing, Witherby Tool Co.......dis 65&10 %
Socket Framing, Douglass'.......dis 65&10 %
Socket Firmers, Crossman.......dis 65&5 %
Socket Firmers, Arlington Edge Tool Co.......dis 65&10 %
Socket Firmers, Buck Bros.......1876 list, dis 22½ %
Socket Firmers, Merrill.......dis 65&10 %
Socket Firmers, Witherby Tool Co.......dis 65&10 %
Socket Firmers, Douglass'.......dis 65&10 %
Socket Corner.......dis 65&10 %
Tanged Firmers.......dis 40@45 %
Tanged Firmers, Butcher's.......$5.00@$5.25 to £
Tanged Firmers. Spear & Jackson's.......$5.00 to £
Tanged Firmers, Buck Bros (Shank).......5.25 to £
Globe Mfg. Co.......dis 65&10 %

Clamps.
Iron, Providence Tool Co.'s Wrt. Iron.......dis 25 %
Iron, Adjustable, Gray's.......dis 20 %
Iron, Adjustable, Lambert's.......dis 20 %
Iron, Adjustable, Snow's.......dis 40&5 %
Iron, Adjustable, Hammer's.......dis 15 %
Iron, Adjustable, Stearns'.......dis 20&10 %
Iron, Cabinet, Sargent's.......dis 65&10 %
Iron, Carriage Makers', Sargent's.......dis 60&10 %

Clips, Axle.
Norway or Best.......dis 60&5 %
Superior.......dis 60&5 %

Coal Hods.
Griffiths'.......dis 33⅓ %

Cockeyes........dis 55 %

Cocks, Brass.
Racking. new list, July 10. 1880
Globe, new list, July 10, 1880
Plain Bibbs, new list. July 10, 1880
Ale and Beer. new list, July 10, 1880 } dis 40&45 %

Coffee Mills.
Board and Box.......dis 50 %
Wilson's.......dis 45 %
Selsor's Cat.......$9.50, $10.50, dis 25 %
American (Enterprise Mfg. Co.).......dis 25 %
The "Swift" (Lane Bros.).......dis 25 %
Webb's Patent.......dis 50 %

Combined Dinner Pail and Lantern.
Per doz $15.00.......dis 30 %

Compasses, Dividers, &c.
Compasses.......dis 55 %
Calipers.......dis 55 %
Dividers.......dis 55 %
Bemis & Call Co.'s Dividers.......dis 60&5 %
Bemis & Call Co.'s Compasses and Callipers..dis 50&5 %
Bemis & Call Co.'s Wing & inside or outside..dis 50&5 %
Bemis & Call Co.'s Double.......dis 60 %
Bemis & Call Co.'s (Call's Patent Inside).......dis 30 %
Excelsior.......dis 50 %
Miller's Patent.......dis 25 %

Coopers' Tools.
Bradley's.......dis 15 @ 20 %
Barton's.......dis 20 %

Corkscrews.—Humason & Beckly Mfg.Co.dis 33⅓ %
Clough's Wire.......dis 30 %

Corn Knives and Cutters.—Bradley's...dis 10 %
Wadsworths.......dis 25 %

Crow Bars.
Cast Steel.......₩ lb 8¼c
Iron, Steel Points.......₩ lb 6¼c

Curling Irons, &c.
⅜, ⅝, ¾ in., $1.80, 2.00, 2.30.......dis 10 %
Curling Tongs.......₩ doz $5.65, dis 10 %
Pinching Irons.......₩ doz $7.50, dis 20 %

Curry Combs.
Fitch's, new list.......dis 50 %
Hotchkiss, Novelty, new list, July, 1880.......dis 25 %
Hotchkiss, Exclr. Supr. Champion.......dis 25 %
Lawrence "Perfect".......dis 25&10 %
Rubber.......₩ doz $10.00, dis 25 %

Curtain Pins.
Silvered Glass.......net
White Enamel.......net

Cutlery.
Meriden Cutlery Co. (Table).......net
Am. Miller Bro.'s Cutlery Co.......dis 25 %
Humason & Beckley, Pocket.......dis 33⅓ %
Naugatuck Cutlery Co.......list net
Aaron Burkinshaw's Pocket.......dis 25 %

Dog Collars.
Embossed Gilt.......dis 20 %
Leather.......dis 40 %
Brass.......dis 40 %
Celluloid.......dis 40 %

Door Springs.
Torrey's Rod, regular size, ₩ doz., $3.......dis 40&10 %
Gray's Rod.......dis 15 %
Bee Rod.......dis 15 %
Warner's.......dis 15&10 %
Gem (Coil):
No. 1, Large Japanned.......₩ doz $4.00
No. 2, Medium, Japanned.......₩ doz 2.75 } dis 40 %
No. 3, Small, Japanned.......₩ doz 2.00
Star (Coil)—For Cop'd, Nickel-Plated &c., see list.
No. 4 ("Shoo Fly") Screen door size, ₩ doz $1.50
No. 5, Screen Door size.......₩ doz 2.00
No. 6, Medium.......₩ doz 2 75 } dis 50 %
No. 7, Large.......₩ doz 4.00
Sabin's Lever..No. 1, $1; 2, $1.50; 3, $2; 4, $2.50..dis 35 %
Sabin's Boss.No. 1, ₩ doz. $4.00; 2 $2.75; 3, $2.dis 33⅓ %
Sabin's Crown.......₩ doz $1.50. dis 33⅓ %
Philadelphia.......5 in., $5.00; 8 in., $7.75, dis 35 %
Barker's Concealed.......dis 20 %
Cowell's... ...No. 1, ₩ doz. $18.00; No. 2, $15 00, dis 50 %
Rubber, complete.......₩ doz. $1.80, dis 10 %
Hercules.......dis 40 %

Drawing Knives.
Arlington Edge Tool Co.......dis 65&10 %
Crossman's No. 1.......dis 65&5 %
Morrill.......dis 65&10 %
Nobles Mfg. Co.......dis 15 %
Bradley's.......dis 35 %
Adjustable Handle.......dis 20 %
Witherby Tool Co.......dis 65&10 %
Douglass.......dis 65&10 %
Globe Mfg. Co.......dis 65&10 %

Drills and Drill Stocks.
Blacksmiths'.......each, $2.50, dis 10 %
Blacksmiths' Self-Feeding.......each, $7.50, dis 20 %
Breast, P. S. & W.......dis 20&10 %
Breast, Hotchkiss'.......dis 20 %
Breast, Wilson's.......dis 20 %
Breast, Millers Falls.......each, $3 00, dis 25 %
Breast, Bartholomew's.......each, $2.50, dis 25&10 %
Ratchet, Merrill's.......dis 10 %
Ratchet, Ingersoll's.......dis 25 %
Ratchet, Whitney's.......dis 20 %
Ratchet, Weston's.......dis 20 %
Ratchet, Moore's Triple Action.......dis 20&25 %
Whitney's Hand Drill, Plain, $11.00 Adjustable, $12.00.......dis 25 %
Wilson's Drill Stocks.......dis 10 %
Automatic Boring Tools.......each, $2.25, dis 20 %

Drill Chucks.
Morse's Beach Patent.......dis 30 %
Morse's Adjustable.......each, $10.00, dis 30 %
Danbury.......each, $8.00, dis 30 %

Egg Beaters.
Dover.......₩ doz. $2.50, dis 2 %
Monroe's.......dis 50 %
National.......₩ doz. $4.50, dis 33⅓ %
Standard.......₩ gross, $18.00, dis 25 %
Family (T. & S. Mfg. Co.).......₩ gross, $18.00, net
Acme.......₩ gross, $12.00, dis 25 %
Triumph (T. & S. Mfg. Co.).......₩ gross, $12.00, net

Elevator Buckets.
Mill E. Buckets, light. 3½ to 10 in (Duc's Improved). ₩ 100, $15 00 @ $54.00.......dis 10 %
Mill E. Buckets, heavy. 5 to 10 in. (Duc's Improved), ₩ doz. $5.60 @ $10.20.......dis 10 %
Storehouse (Duc's Patent), 12 to 17, $12 @ $20.......dis 10 %

Emery and Emery Paper.
Regular numbers.......₩ lb 6c
Flour and F. F.......₩ lb 4c
B. & A. Emery Paper.......dis 30&5 %
Sibley's Emery and Crocus Cloth, large size, $10; medium, $10.50 ₩ ream.......dis 15 %

Enameled and Tinned Ware.
Kettles.......dis 50 %
Sauce Pans.......dis 25 %
Tinned Sauce Pans.......dis 25 %

Escutcheon Pins.
Brass.......dis 50 %

Escutcheons.
Door Lock.......Same discounts as Door Locks
Brass Thread.......dis 55 %
Wood.......dis 25 %

Faucets.
Fenn's.......dis 40 %
Bohren's Patent Rubber Ball.......dis 25 %
Fenn's Cork Stops.......dis 33⅓ %
Star.......dis 55&10 %
Frary's Patent Petroleum.......dis 20&10 %
West's Patent Key.......dis 45 %
Anchor Lock.......dis 45 %
Metallic Key, Leather Lined.......dis 60 %
Cork Lined.......dis 70 %
J. Sommer's Best Metallic Key.......dis 10 %
J. Sommer's Cork Lined, 1st quality.......dis 50 %
Self-Measuring, Enterprise.......₩ doz. $30.00, dis 25 %
Self-Measuring, Lane's.......₩ doz. 36.00, dis 25 %
Self-Measuring, Victor.......₩ doz. 36.00, dis 25 %

Felloe Plates........₩ lb, 10c, dis 20 %

Files.
Auburn.......$5.00 to £, dis 35 %
E. M. Boynton's.......new list, dis 25 %
J. & Riley Carr.......$4.50 to £
J & Riley Carr Horse Rasps.......$4.75 to £
Johnson & Bro.......dis 30 %
Butcher's.......$4.50 to £
Walter Spencer & Co.'s "Diamond".......$4.50 to £
Fisher's.......$4.75 to £
Moss & Gamble.......$4.50 to £
H. Disston & Sons (new list).......dis 40 %
Heller Bros.' Horse Rasps.......dis 25 %
Nicholson.......dis 40 %
New American.......dis 40 %
Union File Co.......dis 40 %
Stubs.......$7.00 to £

Fluting Machines.
Knox, 4½-inch Rolls.......$3.50 each
Knox, 6-inch Rolls.......$4.00 each } dis 25
Eagle, 3½ inch Roll.......$2.15, dis 25 %
Eagle, 5½-inch Roll.......2.85, dis 25 %
Crown, 4½-in., $3.50; 6-in., $4.00; 8-in., $6.50 each, dis 25 %
Crown Jewel.......6-in., $3.40 each, dis 25 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 25 %
Domestic Fluter.......$1.50 each, net
Geneva Hand Fluter, White Metal...₩ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3. $10.00 ₩ doz.......dis 25 %
Shepard Hand Fluter, No. 85, $15; No. 95, $6.50; No. 110, $8.75.......dis 30 %
Clark's Hand Fluter.......₩ doz $15.00, dis 33⅓ %
Combined Fluter and Sad Iron.......₩ doz $15.00, dis 30 %
Buffalo.......₩ doz $10.00, dis 10 %

Fluting Scissors........dis 45 %

Fly Traps.
Paragon.......₩ doz, $3, net

Forks.
Hay, Manure and Spading.......dis 50 %
Plated, A 1, Rogers & Bro.......dis 40&10&5 %
Plated, Reed & Barton.......dis 40&10&5 %

Fruit and Jelly Presses.
Enterprise Mfg. Co.......dis 25 %

Fry Pans.
Burnished list as follows.......dis 65 %
No....... 0 1 2 3 4 5 6 7 8
₩ doz.......$3.00 3.75 4.25 4.75 5.25 6.00 7.00 8.00 9.00
"Acme".......dis 40&10 %

Gauges.
Marking Stanley's.......dis 50&10 %
Marking, Chapin's.......dis 55&10 %
Wire.......dis 70&10 %
Wire, Disston's.......dis 20 %
Wire, Wheeler, Madden & Co.......dis 10 %

Gimlets.
Nail and Spike.......dis 40&10 %
"Eureka" Gimlets.......dis 40&10 %
"Diamond" Gimlets.......dis 40&10 %
Double Cut, Shepardson's.......dis 40&10 %
Double Cut, Hartwell's.......dis 40&10 %
Double Cut, Ives'.......dis 40&10 %
Double Cut, Douglass'.......dis 40&10 %
"Bee".......₩ gro. $12.00, dis 25 %

Glue Pots.
Tinned and Enameled.......dis 25 %
Family, Howe's "Eureka".......dis 25 %
Family, L. F. & C.'s "Handy".......dis 30 %

Grindstone Fixtures.
Sargents Patent.......dis 70&10 %
Reading Hardware Co.......dis 25&10 %

Gun Wads.
U. M. C. B. E., 11 up.......$2.00
U. M. C. B. E., 9&10.......2.30
U. M. C. B. E., 7&8.......2.60
U. M. C. P. E., 11 up.......3.10
U. M. C. P. E., 9&10.......4.00
U. M. C. P. E., 7&8.......4.90 } dis 5&5 %

Halters.
Covert's Pat. Rope.......dis 50 %
Horse and Cattle Ties, Covert's.......dis 50 %

Hammers.
Maydole's.......dis 15 %
Cheney's.......dis 25 %
Hartford Hammer Co. (new list July 1. '81).......dis 20 %
Humason & Beckley.......dis 50 %
Verree.......dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.20, 1.50 and 1.7..dis 25&10 %
Nelson Tool Works.......dis 40&10 %
Warner & Noble's.......dis 5 %
Yerkes & Plumb.......dis 15 %
Wilkinson's Smiths'.......11½c ₩ lb net

Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ₩ doz.dis 10 %
Providence Tool Co., Leg Irons, $25.00 ₩ doz.......dis 10 %
Tower's.......dis 25 %

Handles.—Door or Thumb Latches.
Nos....... 0 1 2 3 4
Per doz... $0.80 1.00 1.18 1.35 1.50.......dis 55&10 %
Roggin's Latches.......₩ doz 35c. @ 40c. net
Bronze Iron Drop Latches.......₩ doz $0.90 @ 1.10
Jap'd Store Door Handles—Nuts, $1.25; Plate, $2.00, no Plate, $1.10.......dis 10 %
Barn Door.......₩ doz $1.60, dis 10 %
Wrought Chest.......dis 65&10 %
Surface Chest.......dis 55&10 %
Flush Chest.......dis 55&10 %
Lifting.......dis 52½&10 %
Saw and Plane.......dis 40&10 %
Boynton's Loop Saw Handles.......50c. dis 35 %
Boynton's Centennial Saw Handles.......30c. dis 25 %
Hammer and Hatchet.......dis 20 %
Brad Awl.......₩ gross, $3.00, dis 20&10 %

Hickory Firmer Chisel, assorted, ₩ gross..$4.50
Hickory Firmer Chisel, large, ₩ gross.......5.00
Apple Firmer Chisel, assorted, ₩ gross.......5.00
Apple Firmer Chisel, large, ₩ gross.......6.00
Socket Firmer Chisel, assorted, ₩ gross.......3.00
Socket Framing Chisel, assorted, ₩ gross..5.00
File, assorted. ₩ gross.......2.75
Auger, assorted, ₩ gross.......5.00
Auger, large, ₩ gross.......7.00 } dis 20&10 @ 25&10
Patent Auger, Ives'.......dis 25 %
Patent Auger, Douglass'.......₩ set $1.25 net
Patent Auger, Swan's.......₩ set $1.00 net

Hangers.
Barn Door, old patterns.......dis 60&10 %
Barn Door, New England.......dis 6 &10 %
Climax (Anti-Friction).......dis 50 %
Challenge.......dis 50 %
"Champion" Medina Mfg. Co.......$15; dis 50&10 %
Sterling Improved (Anti-Friction).......dis 65&10 %
Cheritree.......dis 50 %
Kidder's.......dis 50&5 %
U. S.......4 in., $12; 5 in., $15; dis 60 %
The "Boss".......dis 50&10 %
Terry's Patent.......5 in., $12; 3½ in., $10; dis 40 %

Harness Snaps.
Anchor (T. & S. Mfg. Co.).......dis 60 %
Henshaw's, list of 1½ changed to $14.00.......dis 55&10 %
Judd's, list of 1½ changed to $14.00.......dis 55&10 %
Fitch's (Bristol), list of 1½ change to $14.00...dis 55&10 %
Hotchkiss'.......dis 10 %
Andrews'.......dis 50 %
Sargent's.......dis 70&10 %
German, low list, Sep., 1882.......dis 33⅓ %
German, Sargent's new list.......dis 60&10 %
Covert.......dis 50 %
Covered Spring, new list, Oct., 1882.......dis 60&10 %

Hatchets.
Isaiah Blood.......dis 25 %
Shingling, Nos. 1 2 3.......₩ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3.......₩ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3.......₩ doz 7.50 8.00 8.50
Hunt's.......dis 25 %
Shingling, Nos. 1 2 3.......₩ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3.......₩ doz 7.75 8.50 9.25
Lathing, Nos 1 2 3.......₩ doz 7.30 8.25 9.00
Hurd's.......dis 25 %
Shingling, Nos. 1 2 3.......₩ doz $8.00 $8.50 $9.00
Claw, Nos. 1 2 3.......₩ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3.......₩ doz 8.00 8.50 9.00
Yerkes & Plumb.......dis 25 %
Shingling, Nos. 1 2 2.......₩ doz $7.50 $8.00 $8.50
Claw, Nos. 1 2 3.......₩ doz 8.25 8 75 9.25
Lathing, Nos. 1 2 3.......₩ doz 7.50 8.00 8.50
Simmons'.......dis 20 %
Shingling, Nos. 0 1 2 3..₩ doz $7 50 $8.00 $8.50 $9.00
Claw, Nos. 0 1 2 3..₩ doz 9.00 9.50 10.00
Lathing, Nos. 0 1 2 3..₩ doz 8.00 8.50 9.00
Broad, Nos. 1 2 3 4..₩ doz 9.00 10.00 12.00 14.00
Broad, Nos. 5 6 7 8..₩ doz 16.00 18.00 20.00 22.00
Collins.......dis 10 %
Shingling, Nos. 1 2 3.......₩ doz $6.00 $6.50 $7.00
Claw, Nos. 1 2 3.......₩ doz 6.50 7.00 7.50
Lathing, Nos. 1 2 3.......₩ doz 6.50 6.50 7.00
Peck's Champion Blade.......dis 30 %
Shingling, Nos. 1 2 3.......₩ doz $8.00 $8.50 $9.00
Lath, Nos. 1 2 3.......₩ doz 8.00 8.50 9.00
Claw, Nos. 1 2 3.......₩ doz 9.00 9.50 10.00
Half, Nos. 1 2 3.......₩ doz 8.00 8.50 9.00
Ax Pattern, Nos. 1 2 3.......₩ doz 10.00 11.00 12.00

Hay Knives.
"Lightning".......₩ doz $20.00 net 5 %
Wadsworth's.......dis 33⅓ %

Hinges.
Gate, Western.......₩ doz $4.00 dis 45&10 %
Gate, N. E.......₩ doz $7.70, dis 45&10 %
Gate, N. E. Reversible.......₩ doz $0.45, dis 45&10 %
Gate, Clark's, Nos. 1 2 3.......dis 50 %
Gate, N. Y. State.......₩ doz $5 05, dis 45&10 %
Gate, Automatic.......₩ doz $12.50, dis 40 %
Gate, Common Sense.......₩ doz pair $4 50, dis 50 %
Gate, Seymour's.......dis 45&10 %
Gate, Shepard's.......Nos. 10, 20 & 25, dis 50&10 %
Rolled Blind Hinges.......dis 60&10 %
Rolled Plate.......dis 60&10 %
Rolled Raised.......dis 60&10 %
Plate Hinges { 8, 10 & 1 in., $7.00 ₩ 100 lb
"Providence" { over 12 in., $0.00 ₩ 100 lb } ..dis 10 %
Screw Hook and { 8, 10, 12 in., $7.50 ₩ 100 lb
Strap. { 14 to 36 in. $6.50 ₩ 100 lb } ..dis 10 %
Heavy Welded Hook { 8 to 12 in., $7.50 ₩ 100 lb; 14 in & up, $6.00 ₩ 100 lb } dis 20 %
Screw Hook and Eye....... { ⅜ & 1 in. 9c; ⅝ in., 9c; ½ in., 10c; ⅜ in., 12c } dis 20 %
Wrought Strap and T list, Dec. 20, '77.......dis 40&10&10 %

Hoes.
Riveted Shank.......₩ doz $5.00, dis 50 %
Socket.......₩ doz $5.25, dis 50 %
Grub.......dis 15 %
Planters'.......dis 35 %
Scovill Pattern.......dis 30 %
Scovill Pattern, Handled.......dis 25 %
Hick's Pat. Solid C. S. Planters'.......dis 20&10&30 %
Hick's Pat Solid C. S., Scovill Pattern.......dis 20&5&35 %
Winsted & Lane, Planters'.......dis 25 %
Winsted & Lane, Scovill Pattern.......dis 20&25 %
Magic.......₩ doz $5 net

Hooks.
Bird Cage, Sargent's list.......dis 55&10 %
Bird Cage, Reading.......dis 35&10 %
Cotton.......₩ doz $4.00, dis 50 %
Cotton Patented (N. Y. Mallet & Handle W'ks), dis 30 %
Cotton (Humason & Beckley Mfg. Co).......dis 40 %
Belt.......dis 60&10 %
Bench—Hotchkiss' $5.00 ₩ doz.......dis 10 %
Weston's. No. 1, $10.00; No. 2, $9.00 ₩ doz.......dis 25 %
McGill's, $3.00 ₩ doz.......dis 10 %
Clothes Line, Sargent's list.......dis 65&10 %
Clothes line, Reading list.......dis 45&5&10 %
Ceiling, Sargent's list.......dis 60&10 %
Harness, Reading list.......dis 40&10 %
Coat and Hat, Sargent's list.......dis 60&10 %
Coat and Hat, Reading.......dis 40&10 %
Picture Hooks, Brown's Pat. Solid Brass, $4.60 ₩ gross.......dis 25 %
Tassel and Picture (T. & S. Mfg. Co.).......dis 40 %
Wrought Staples and Hooks and Staples.......dis 60&10 %
Wrought Staples, Stanley's list.......dis 60&10 %
Wire Screw Hooks and Eyes.......dis 55&10 %
Grass and Bush.......dis 45@50 %
Whiffletree—Patent.......dis 35 %
Hooks and Eyes—Malleable Iron.......dis 60&10 %
Hooks and Eyes—Brass.......dis 60&10 %

Horse Nails.
Ausable: Nos. 5 6 7 8 9 10
Plain, ₩ lb..30c 28c 25c 24c 23c 22c..dis 20&10&2 %
Finish'd ₩ lb..31c 28c 27c 25c 24c 23c..dis 20&10&2 %
Clinton, Plain. ₩ lb 23c 21c 20c 19c 18c..dis 20&10&2 %
Clinton, Fin., ₩ lb 24c 22c 21c 20c 19c..dis 20&10&2 %
Essex. ₩ lb..31c 28c 26c 25c 24c 23c.......dis 30 %
Putnam "...31c 28c 26c 25c 24c 23c.......dis 20 %
Vulcan, "...3?c 27c 25c 24c 23c 22c...dis 10&10 %
Globe, "...31c 28c 26c 25c 24c 23c.......dis 20 %
A. C., "...31c 28c 26c 25c 24c 24c.......dis 20 %
Ch'mpl'n Forged "...18c 25c 23c 22c 21c 20c.......dis 10 %

Horse Shoes.
Burden.......₩ keg $4.87½
R. I. Horse Shoe Co., Perkins' Improved. Light, Medium and Heavy.......₩ keg $4.87½
Mule Shoes.......₩ keg $5.87½
Dunning's Steel.......₩ keg $9.25

Ice Awls, Chisels, &c.
American Ice Chisel.......₩ doz $3.50 net
National Ice Chisel.......₩ doz $6.25 dis 20 %
Novelty Ice Breakers.......₩ doz. $6.25 dis 20 %
White's Sliding Head Picks.......₩ doz $2 50 dis 40 %
Dunlap's Ring Picks.......₩ doz $3.00 dis 40&10 %
Wood Head Picks, Sargent's.......₩ doz $1 60 dis 40&10 %
Iron Head Picks, Sargent's.......₩ doz $1.25 dis 40&10 %
Ice Mallets, Pick in head.......₩ doz $1.75 dis 15 %
Ice Mallets, Pick in Handle.......₩ doz $2.00 dis 15 %
Ice Axes, Small Cast or Malleable..₩ doz $1.20 dis 10 %
Combination Ice Tools.......₩ doz $2.00 net

Ice Cream Freezers.
Amn. Mch. Co.......dis 40 %

Ice Tongs.
Champion.......₩ doz $6.00 dis 20&10 %
Family.......₩ doz $2.75 dis 15 %

Kettles.
Brass, 7 to 13 inches inclusive.......₩ lb 32c net
Brass larger than 13 inches.......₩ lb 35c net

Knives.
Ames' Butcher Knives.......dis 20 %
Ames' Shoe Knives.......dis 15 %
Ames' Bread Knives.......₩ doz $1.50 dis 15 %
Moran's Shoe and Bread Knives.......dis 20 %
Hay and Straw, Wadsworth's.......dis 33⅓
Table and Pocket.......See Cutlery

Knobs.
Carriage (Jap'd 80c ₩ gross).......dis 60&10 %
Base—Common.......dis 30&10 %
Hemacite Door Knobs.......new list, dis 35&5 %
Door Mineral
Door Por. Jap'd
Door Por. Plated
Door Por. } Same discounts as Door Locks.
Furniture Plain.......75c gross inch, dis 10 %
Furniture, Wood Screws.......dis 20 %
Picture (T. & S. Mfg. Co).......dis 60&10 %
Picture, Sargent's.......dis 5 &10 %
Hemacite, Picture.......dis 35 %
Shutter, Porcelain.......dis 55&60 %

Ladles.
Melting, Sargent's.......dis 45&10 %
Melting, Reading.......dis 30&10 %
Melting, Monroe's Patent.......₩ doz $4.00 dis 40 %
Melting, P. S. & W.......dis 20&10 %

Lanterns.
Tubular.......No. 0, $8.05; No. 1, $10.15 With Guards 35c extra } net
Nail City.......No. 1 ₩ doz $10; No. 2, $6, net
Meteor.......No. 1, ₩ doz. $9.50; No. 2, $8.5 , net
Hurricane, No. 2.......₩ doz $5.75, net
Peerless, No. 5.......₩ doz $11.75, dis 10&10 %
Brady's Patent.......dis 10&10 %
Ætna.......dis 10&20 %
Yankee.......dis 10&10 %
De Beque.......dis 10&10 %
Police Small, $6.25; Med., $7.50; Large, $12.00, dis 10 %
Convex Reflector.......$2.75 ₩ doz, dis 15 %

Lawn Mowers.
Pennsylvania, Philadelphia and Excelsior new list.......dis

Lemon Squeezers.
Porcelain Lined.......₩ doz $6.00, dis 30 %
Wood.......₩ doz 3.00, dis 30 %
Eureka, Tinned.......₩ doz 3.00, dis 10 %
Dunlap's Improved.......₩ doz 3.75, dis 20 %
Sammis'...No. 1, $5; 2, $8.40; 3, $15 ₩ doz dis 25&10 %

Townsend's Patent.......$6 00 ₩ doz, dis 33⅓ %
Jennings "Star".......$3.00 ₩ doz net
The "Boss".......₩ doz $4.00, dis 10&10 %
Dean's, Nos. 1, ₩ doz, $15 00; 2, $9.00; 3, $5.60.......dis 40 %

Lines.—Linen Fish.......dis 25&10 %
Cotton Chalk.......dis 55 %
Silver Lake, Braided, Nos. 0. $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gross.......dis 20 %
Masons' Linen.......dis 33⅓ %
Masons' Colored Cotton.......dis 45 %
Wire Clothes, Galvanized.......each 25c@40c net

Locks and Latches.
Cabinet, Eagle
Cabinet, Gaylord
Cabinet, Bridgeport } Changes made in list price of some numbers Jan. 1, 1881, dis 25&2 %
Cabinet, P. & F. Corbin.......dis 25&2 %
Cabinet, A. E. Deitz.......dis 30 40 %
Cabinet, Stoddard Lock Co.......dis 40&5 %
Trunk, new list, Jan. 1, 1881.......dis 15&2 %
Langstroth & Crane's List, Jan. 1, '77:
Round Key, Nos. 1 to 5.......dis 40&10 %
Round Key, Nos. 5½ to 12.......dis 40&10 %
Flat Key.......dis 33⅓&10 %
A. E. Deitz, Flat Key.......dis 30@40 %
Yale Lock Co., Flat Key.......dis 40 %
"Shepardson" or "U. S.".......dis 35 %
"Felter" or "American".......dis 33⅓ %
Plate.......dis 33⅓&2 %
F. Many's "Extension Cylinder".......$10.50 ₩ doz net

DOOR LOCKS, ETC.
Branford
Norwalk
Norwich
P. & F. Corbin
Russell & Erwin
Mallory, Wheeler & Co.
Whipple Mfg. Co.
Trenton Lock Co. } List prices as revised March 8, 1882, dis 45&2 %
Reading Hardware Co. (low list).......dis 40&2 %
Padlocks—Russell & Erwin
Mallory, Wheeler & Co.
Norwich Lock Mfg. Co.
Wm. Wilcox & Co. } dis 35 % and 2 % for cash
Yale Lock Mfg. Co.'s "Standard".......dis 40 %
Romer's.......dis 25 @ 40 %
Conestoga.......dis 60 %
Miller's 6 Lever.......dis 33⅓ %
Scandinavian (Moore Bros.).......dis 80 %
J. H. McWilliams.......dis 10 %
A. E. Dietz.......dis 35 %
"Star".......dis 35 %

Lustro.—4-oz. bottles, ₩ doz $2.00; ₩ gros $18.00 net

Mallets.—Hickory.......dis 10&10 %
Lignumvitæ.......dis 10&10 %
Penfield Block Co., Lig., Apple & Hickory.......dis 30 %

Meat Cutters.
Dixon's (P.S.&W.) Nos. 1 2 3 4
₩ doz..$14.00 17.00 19.00 30.00—dis 25&5 %
Miles' Challenge.......Nos. 1 2 3
₩ doz..$22.00 30.00 40.00 - dis 35 %
Perry's. Nos. 1 2 3 4 4 g'rd 5 g'rd
Each...$3.00 4.00 5.00 11.00 13.00 36.00—dis 25&5 %
Woodruffs (P. S. & W.).......Nos. 100 150
₩ doz..$15.00 18.00—dis 25&5 %
Hales'.......Nos. 11 12 13
₩ doz..$27.00 35.00 45.00—dis 50&10&2 %
Draw Cut..Nos. 5 2 6 8 10
Each..$50.00 75.00 80 00 225.00 400.00—dis 20
American.......dis 25
Nos....... 1 2 3 4 B 5
Each....... $5.00 7.00 10.00 25.00 60.00 60.00
Kieser's No. 55.......$40 ₩ doz dis 40 %
Kieser's Gem.......$25 ₩ doz, dis 40 %
Silver & Deming.......dis 25 %
Pennsylvania.......dis 40&10 %
Nos....... 1 2 3 00
₩ doz.......$24 00 28.00 36.00 28.00
Beef Shavers (Enterprise Mfg. Co.).......dis 25 %

Mincing Knives.
Am. (2d quality), ₩ gross, 1 blade, $7 2 blades, $12 3 blades, $18.......net
Lothrop's.......dis 20&10 %
Smith's, ₩ doz, Single, $2.25; Double, $3...dis 33⅓&10 %
Cowles Hdw. Co.......dis 40&10 %

Molasses Gates.
Stebbins Pattern.......dis 70&10 %
Stebbins Genuine.......dis 67½&10 %
Stebbins Tinned Ends.......dis 40&10 %
Chase's Hard Metal.......dis 50&10 %
Bush's.......dis 20 %
Lincoln's Pattern.......dis 60&10 %
Weed's.......dis 15 %
Boss Nos. 1 2 3 4
$7.00 8.00 9.00 10.00.......₩ doz
Boss, Japanned Finish.......dis 60&10 %
Boss, Bronze Finish.......dis 50&10 %

Nails........See Trade Report

Nuts and Washers.—(In lots less than 100 lb add ½c to list)
Square Nuts.......7c off list
Hexagon Nuts.......7c off list
Washers.......5c off list

Nut Crackers.
Table (Humason & Beckley Mfg. Co.).......dis 33⅓ %
Blake's Pattern.......₩ doz $2.00, net
Turner & Seymour Mfg. Co.......dis 50 %

Oakum.—is on 100 bales and over ½ % ₩ lb.
Best.......₩ lb 9 c
U. S. Navy.......₩ lb 8 c
Navy.......₩ lb 6¾c

Oilers.—Zinc and Tin.......dis 60 %
Brass and Copper.......dis 50 %
Malleable (Hammer's).......₩ doz. $5.00, dis 10 %
Prior's Patent or "Paragon" Zinc.......dis 60 %
Prior's Patent or "Paragon" Brass.......dis 50 %
Olmstead's, Tin and Zinc.......dis 60 %
Olmstead's, Brass and Copper.......dis 50 %
Broughton's, Zinc.......dis 50&10 %
Broughton's, Brass.......dis 50 %

Ox Balls.

Packing, Steam.
N. Y. Belting and Packing Co.......dis 30 %

Pencils.
Faber's Carpenters'.......high list, dis 50 %
Faber's Round Gilt.......₩ gross $4.25, net
Dixon's Lead.......₩ gross $4.50, net
Dixon's Lumber.......₩ gross $6.75, net
Dixon's Carpenters'.......dis 40&10 %

Picture Nails.
Brass Head, Sargent's list.......dis 45&10 %
Brass Head, T. & S. Mfg. Co.......dis 50 %
Porcelain Head, Sargent's list.......dis 45&10 %
Porcelain Head, Judd's list.......dis 40 %
Porcelain Head, T. & S Mfg. Co.......dis 40 %
Niles' Patent.......dis 25 %

Pinking Irons........₩ doz 75c, net

Plaiting Machines.
Magic.......₩ doz $10.00, net
Astor Plaiting Machine.......each $15.00. dis 20 %
Crown Plaiting Machines.......dis 25 %
6 in., $6.00; 10 in., $8.00 each.

Planes and Plane Irons.
Bench, First Quality.......dis 20 %
Bench, Second Quality.......dis 25 %
Molding.......dis 15 %
Bailey's (Stanley R. & L.Co.) new list, Jan.'79.dis 20&10 %
The Stanley (S. R. & L. Co.) new list. Jan.'79..dis 20&10 %
Bailey's "Victor".......dis 20&10 %
Defiance Adjustable.......dis 20&10 %
Laflin Mfg. Co.......dis 35 %
Plane Irons, Butcher's.......$5.50 to £
Plane Irons, Buck Bros.......$5.00 to £
Plane Irons, Auburn Tool Co.......dis 20 %
Plane Irons, The Globe Mfg. Co., "Baldwin Iron".......dis 20 %
Plane Iron, Ohio Tool Co.......dis 20 %
Plane Irons, Sandusky Tool Co.......dis 20 %

Pliers and Nippers.
Button's Patent.......dis 33⅓ %
Hall's Pat Compound Lever Cutting Nippers, No. 2, 5 in., $3.50; No. 4, 7 in., $21.00 ₩ doz.......dis 25 %
Humason & Beckley Mfg. Co.......dis 33⅓ %
Gas Pliers.......dis 50 %
Eureka Pliers and Nippers.......dis 40 %
Russell's Parallel.......dis 25 %
P. S. & W. Cast Steel.......dis 35 %
P. S. & W. Tinners' Cutting Nippers.......dis 15 %

Plumbs and Levels.
Disston's.......dis 40 %
Stanley R. & L. Co.'s Pat. Adjustable.......dis 65&10 %
Stanley R. & L. Co.'s Non-Adjustable.......dis 65&10 %
Chapin's Patent Adjustable.......dis 65&10&10 %
Chapin's Non-Adjustable.......dis 65&10&10 %
Standard Rule Co.'s New Adjustable.......dis 65&10 %
Standard Rule Co.'s Non-Adjustable.......dis 65&10 %
Johnson's Patent Adjustable.......dis 60&10 %
Pocket Levels.......dis 65&10 %
Davis' Inclinometers.......dis 20 %

Post Hole and Tree Augers.
Samson Post Hole Digger.......₩ doz $37.50, dis 20 %
Fletcher Post Hole Augers.......₩ doz $30.00, dis 20 %
Vaughan's Post Hole—
6 in., $23.60; 7, 8 and 9 in., $25.00 ₩ doz.......dis 20&10 %
Eureka Diggers ₩ doz $27.00.......net
Leed's each $2.50.......net

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw, ₩ doz $19.00, dis 20 %
Disston's Pruning Hook.......₩ doz $12.50, dis 20 %
E. S. Lee & Co.'s Pruner.......dis 33⅓ %
Pruning Shears.......₩ doz $5.50 @ 6.00
Wheeler, M. & Co.'s Combination.₩ doz $12, dis 20&10 %
Dunlap's Saw and Chisel.......₩ doz $5.00, dis 10 %

Pulleys.
Hot House and Tackle.......dis 60&10 %
Jap'd Screw.......dis 60&10 %
Brass Screw.......dis 55&10 %
Jap'd Side.......dis 60&10 %
Jap'd Clothes Line.......dis 55&10 %
Hay Fork, Solid Eye....$4.50; Swivel, $5.00, dis 50&10 %
Hay Fork, "Anti Friction".......$6.75, dis 10&10 %
Hay Fork, "F" Common and Pat. Bushed.......dis 20 %
Hay Fork, Tarbox Pat. Iron.......dis 20 %
Shade Rack.......dis 50 %

Punches.
Belt or Drive.......₩ doz $2.00; 2.25 2.50, dis 50 %
Bemis & Call Co.'s Cast Steel Drive.......dis 50&5 %
Bemis & Call Co.'s Springfield Socket.......dis 5 &5 %
Spring.......₩ doz $7.00, dis 40&7½ %
Spring, Leach's Patent.......dis 15 %
Bemis & Call Co.'s Spring and Check.......dis 40 %
Solid, Tinners'.......₩ doz $1.44. dis 40 %

Rail.
Sliding Door, Wrought Brass.......₩ lb 43c, dis 30 %
Sliding Door, Bronzed Wrt. Iron.......₩ foot 12c. dis 35 %
Sliding Door, Iron, Painted.......₩ foot 4c. dis 10&10 %
Barn Door....Inch....... ⅜ ⅝ ¾
Per 100 feet $2.60 3.60 5.60—dis 10 %
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet.......$2.10 2.70 3.90—net
Terry's Wrought Iron, 5c. ₩ foot.......net

Razors.
J. R. Torrey Razor Co.......dis 15 %

Razor Strops.
Genuine Emerson.....dis 60 @ 65 %
Badger's Emerson.....dis 60 @ 65 %
Badger's.....dis 33⅓ %
Badger's (not Emerson).....₱ doz $2.00, dis 20 %
Imitation Emerson.....dis 40&5 %
Hunt's.....dis 15 @ 2 %
Chapman.....dis 10 %
Saunder's.....dis 10 %
Torrey's.....dis 20 %

Rivets.
Iron and Tinned, new list, Dec. 10, 1881.....dis 45 %
In bulk, new list, Dec. 10, 1881.....dis 45 %
Copper Rivets and Burrs.....dis 50 %

Nos..	7	8	9	10	11	12	13	14	15
₱ lb..	49c	50c	52c	54c	56c	48c	60c	65c	70c

Rivet Sets......dis 40 %

Rods.
Stair, Brass.....dis 25 %
Stair, Black Walnut.....60c. ₱ doz, dis 10 %
Stair, American Patent.....dis 20 %

Rollers.
Barn Door, Sargent's list.....dis 60&10&10 %
Acme (Anti-Friction).....dis 50 %

Rope.
Mnfs' List, July 6 and 17, 1882.....ans 1C ₱ lb
Manila.....⅜ inch and larger ₱ lb 16½c
Manila.....⅜ inch ₱ lb 17 c
Manila.....⅛ and 5-16 inch ₱ lb 17½c
Manila, Tar'd Rope.....₱ lb 16 c
Manila, Tar'd Lath Yarn.....₱ lb 16 c
Manila, Hay Rope.....₱ lb 16½c
Sisal.....½ inch and larger ₱ lb 11 c
Sisal.....⅜ inch ₱ lb 11½c
Sisal.....⅛ and 5-16 inch ₱ lb 12 c
Sisal, Hay Rope.....₱ lb 11 c
Boxwood. Ivory.

Rules.
Chapin's.....dis 60%&10 %; dis 55&10 %
Standard.....dis 60%&10 %; dis 55&10 %
Stanley.....dis 60%&10 %
Stephens.....dis 55%

Sad Irons.
From 4 to 8.....₱ lb 9½c net
Self-Heating.....₱ doz $9.00 net
Self-Heating, Tailors'.....₱ doz $18.00 net
Gleason's Shield and Toilet.....dis 25 %
Mrs. Pott's Irons, Doubled Pointed.....dis 35 %
Mrs. Pott's Irons, Square Back.....dis 35 %
Enterprise Star Irons, new list, July 20, 1882...dis 35 %
Combined Fluter and Sad Iron....₱ doz $15.00, dis 15 %

Sand Paper.
Raeder & Adamson's Flint, 00 to 1½ $4.75 ₱ ream
Raeder & Adamson's Flint, 2, 2½ & 3. 5.25 ₱ ream
Raeder & Adamson's Flint, Assorted. 4.75 ₱ ream
Raeder & Adamson's Star.....5.75 ₱ ream
Raeder & Adamson's Emery...₱ ream $0.50 @ 11.50
dis 50&5 %
Parties Flint.....$4.75&$5.25 ₱ ream dis 35 %
Parties Harrison, $3.75 ₱ ream.....dis 35 %
New England same list as B. & A. Flint.....dis 30 %
Gage's.....dis 30&5 %

Sash Cord.
Common.....₱ lb 16c net
Patent.....₱ lb 17c @ 18c net
Silver Lake, Hemp.....₱ lb 50c, dis 10 %
Silver Lake, White Cotton.....₱ lb 50c, dis 10 %
Silver Lake, Drab Cotton.....₱ lb 55c, dis 10 %
Raw Hide, ₱ foot, ¼ in., 5c.; 5-16 in., 7c.; ⅜ in., 10c.
.....dis 15 %
Steel Ribbon.....dis 10 %

Sash Locks.
Clark's, No. 1, $10.00; No. 2, $8.00 per gross.....dis 33⅓ %
Ferguson's.....dis 33⅓ %
Walker's.....net
Hammond's Window Springs.....dis 25 %
Northup Window Springs, No. 1, $10.00 ₱ gross..dis 15 %
The Perfect, Clark & Smith, Plain Jap. ₱ gro. $10.00 net
The Perfect, Clark & Smith, Por. K'b Jap. ₱ gro. $14 net
The Perfect, Clark & Smith, N-Plated..₱ gro. $27.00 net
"Universal".....dis 30 %

Sash Weights.
Solid Eyes, in 500 lb lots and over.....₱ lb 1¾c net

Sausage Stuffers or Fillers.
Miles.....₱ doz $30 dis 25&5 %
Perry.....₱ doz, No. 1½; No. 0, $21, dis 25&5 %
Draw Cut No. 4.....each $30.00, dis. 20 %
Enterprise Mfg. Co.....dis 25 %
Silver's.....dis 25 %

Saws.
Disston's Circular.....dis 40 %
Disston's Mill.....dis 40 %
Disston's Cross Cut.....dis 40 %
Disston's Hand, Panel, Rip, &c.....dis 20 %
Boynton's Lightning Cross Cuts, new list.....dis 40 %
Boynton's One-Man, all lengths, new list.....dis 40 %
Boynton's Billet Webs, 30 inch. new list.....dis 25 %
Boynton's Lightning Buck Saws X Bar.....dis 40 %
Boynton's Lightning Hand, Panel and Rip.....dis 25 %
Wheeler & Clemson Mfg. Co.'s Hand.....dis 30 %
W. H. & C. Mfg. Co. Cross Cuts.....dis 30 %
Livingston's Butcher and Kitchen.....dis 20 %
Livingston's Framed Wood—

Nos	101	102	103	104	105
Per doz.	$10.00	8.50	10.00	7.50	6.30 net

Peace Circular and Mill.....dis 40 %
Peace Hand, Panel and Rip.....dis 25%
Peace Cross Cuts.....dis 35 %
Peace Band Saws, all widths.....dis 10 %
Richardson's Circular.....dis 40 %
Richardson's Mill and X Cut.....dis 40 %
Richardson's Hand Panel, Butcher and Web Saws.....dis 25 %

Saw Frames.
White, Vermont.....₱ doz $1.50, dis 25&10%
Red, Polished and Varnished.....₱ doz $1.50, dis 10%
Saw Rods.....$10 list, dis10 & 10%

Saw Sets.
Boynton's Patent X Cut, per doz, $12.00; Hand Saw per doz. $10.00.....dis 25 %
Shilman's Genuine.....₱ doz $3.50 and $4.50 dis 10 %
Shilman's Imitation.....₱ doz $2.25, dis 30&10 %
Common Lever.....₱ doz $2.00, dis 30&10 %
Leach's.....No 0, $3.50; No. 1, $15.00, dis 15 %
Nash's.....dis 20&10 %
Hammer, Hotchkiss.....$5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent.....dis 30&5 %
Bemis & Call Co.'s Lever & Spring Hammer..dis 30&5 %
Bemis & Call Co.'s Plate.....dis 10 %
Bemis & Call Co.'s Cross Cut.....dis 12½ %
Aiken's Genuine.....$13.00, dis 50&10 %
Aiken's Imitation.....$7.00, dis 50 %
Hart's Patent Lever.....dis 20 %
Disston's.....No. 1, $15; No. 5, $12, dis 35&10 %
Merrill's.....

Scales.
Beach, Counter, No. 171.....₱ doz $42, dis 37½&10 %
Hatch, Tea, No 161.....₱ doz $15.00, dis 37½&10 %
Union Platform.....$6.00, dis 45 %
Fairbanks'.....dis 20 %
Richie Bros.....dis 20 & 10 %
Buffalo Scale Co.....dis 20&5 %
Forsyth Scale Co.....dis 25 %
Howe's.....dis 20&10 %
Chatillon's Grocers'.....dis 40 %
Chatillon's Eureka.....dis 25 %
Family Universal.....dis 50 %
Family Favorite.....dis 30 %
Family, Turnbull's.....dis 30 %
Scale Beams, List of January 12, 1882.....dis 25%&10 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.), $6.50, dis 20&10%
Box, 1 Handle.....₱ doz $4.00, dis 10 %
Box, 2 Handle.....₱ doz $6.00, dis 10 %
Defiance Box and Ship.....dis 20&10 %
Foot.....dis 45&10 %
Ship, common.....₱ doz $3.50 net
Ship, Providence Tool Co.....dis 10 %

Screen Corners.
Porter's Pat. Window and Door Frame.....dis 33⅓

Screw Drivers.
Douglas Mfg. Co.....dis 20&10&10 %
Disston's.....dis 40 %
Disston's Patent Excelsior.....dis 40 %
Buck Bros.....dis 25 %
Stanley Rule & Level Co.'s, Varnished Hdls..dis 50&10 %
Stanley Rule & Level Co.'s, Black Handles..dis 40&10 %
Sargent & Co.'s.....dis 50&10 %
Gay's Double Action Ratchet
₱ doz, 4 in., $9.00; 5 in., $10.20; 6 in., $12.00—dis 35 %
Mallett & Co.'s Double Action Clutch
₱ doz, 4 in., $7.00; 5 in., $8.00; 6 in., $9.00—dis 15 %
Champion.....dis 25 %
Clark's Patent.....dis 25 %

Screws.
Flat H'd Iron.....dis 30 %
Round Head Iron.....dis 25 %
Flat Head Brass.....dis 30 %
Round Head Brass.....dis 20 %
Brass and Silver Capped.....dis 40 %
Japanned, list of Plain Screws.....dis 70 %
Coach, Patent Gimlet Point.....dis 60 %
Coach, Common or Lag.....dis 60 %
Bed.....dis 10 %
Machine, Flat Head, Iron.....dis 55 %
Machine, Round Head, Iron.....dis 50 %
Bench, Iron.....dis 55&10 %
Bench, Wood, Beech.....₱ doz $3.00, dis 10 %
Bench, Wood, Hickory.....dis 20&10 %
Hand, Wood.....dis 20&10 %
Hand Rail, Sargent's.....dis 60&10 %
Hand Rail, Humason, Beckley & Co.'s.....dis 40&10 %
Hand Rail, Am. Screw Co., list of Jan. 1, '81.....dis 70 %
Jack (Wilson's).....dis 25 %

Screw Window Balances.
R. B. Huguniu's, No. 1, $2.10; No. 2, $1.75; No. 3 $1.60.....₱ doz net

Scroll Saws.
Lester, $10.00.....dis 25 %
Rogers, $3.50.....dis 25 %

Shears and Scissors.
American (Cast) Iron.....dis 70 %
Pruning.....see Pruning Hooks and Shears.
Parsons's Lamp Trimmers.....₱ doz $3.75
Tinners'.....dis 15 %
Seymour's, List, Dec., 1881.....dis 60 %
Heinsch's, List, Dec., 1881.....dis 60 %
Heinsch's Tailor's Shears.....dis 33⅓ %
Mass. Cutlery Co. St. Trimmers.....dis 25 %
Wise, J., & Sons' list, Dec., 1881.....dis 60 %

Sheaves.
Sliding Door, M. W. & Co. list.....dis 40&2 %
Sliding Door, R. & E. list.....dis 60&10&2 %
Sliding Door, Patent Roller.....dis 60&10&2 %
Sliding Door, Patent Roller, Hatfield's.....dis 60&10&2 %
Sliding Door, Russell's Anti-Friction.....dis 60&10&2 %
Sliding Door, Moore's Anti-Friction.....dis 45 %
Sliding Shutter, R. & E. list.....dis 60&10&2 %
Sliding Shutter, Sargent's list.....dis 60&10 %
Sliding Shutter, Reading list.....dis 60&10 %
Moore's Anti-Friction (Hanging).....dis 44 %

Shovels and Spades.
Ames, New list, July 1, 1881.....dis 15 %
Griffiths.....dis 40&10 %
Old Colony.....dis 15 %
Payne Pettebone & Son, new list.....dis 40&10 %
Payne Pettebone & Son, R. R. Shovels.....dis 15 %
Remington's (Lowman's Patent).....dis 30 %
Rowland's.....dis 40&10%

Shovels and Tongs.
Iron and Brass Head, R. & E. list.....dis 60&10&2 %
Polished Steel, new list.....dis 50&10&2 %

Slates.
Square Frames, by case.....dis 70 %
Less than a case.....dis 65&10 %

Sledges and Stone Breakers.
Nelson Tool Works.....dis 40&10 %

Spoke Shaves.
Defiance Metallic.....dis 20&10 %
Iron.....dis 45 %
Wood.....dis 30 %
Bailey's (Stanley R. & L. Co.), new list.....dis 30&10 %
Stearns'.....dis 30&10 %

Spoke Trimmers.
Bonney's.....₱ doz $10.00, dis 40&5 %
Stearns'.....₱ doz $9.00, dis 20&10 %
Ives'.....No. 1, $15.00; No. 2, $12.00 ₱ doz, dis 55&10 %
Douglass'.....₱ doz $9.00, dis 15 %

Spoons.
Basting.....dis 60&10&10 %
Riveted Table and Tea.....dis 55 %
Solid Table and Tea.....dis 55 %
Britannia.....dis 60... %
Reed & Barton.....dis 40&10&5 %
Hall & Elton.....dis 40&10&5 %
Holmes, Booth & Haydens.....dis 40&10&5 %
German Silver.....dis 50&10 %
Cast Steel, Silver Plated.....dis 33⅓ %
Tin (P. S. & W.), Teas.....$1.25 ₱ gross, net
Tin (P. S. & W.), Tables.....$2.00 ₱ gross, net
Tin (Cowles Hdw. Co.).....dis 10 %
Tin (Cowles Hdw Co.), case lots.....dis 20 %

Stocks and Dies......dis 5&10 %
"Lightning" Screw Plate.....dis 10 %

Stone.
Hindostan No. 1, 6c; Axe, 8c.....dis 40 %
Hindostan Hacker Stone.....₱ gross $12.00 dis 10 %
Sand Stone.....₱ lb 6c, dis 33⅓&10 %
Washita Stone.....No. 1, ₱ lb 20c net
Washita Stone.....No. 2, ₱ lb 16½c net
Washita Stone, Slips.....No. 1, ₱ lb 40c net
Arkansas Stone No. 1, 4 to 6 in.....₱ lb $1.35 net
Arkansas Stone No. 1, 6 to 9 in.....₱ lb $2.00 net
Turkey Oil Stone (Chase).....4 to 8 in., ₱ lb, 60c, dis 10 %
Turkey Slips (Chase).....$1.75 ₱ lb dis 10 %
Lake Superior (Chase).....₱ lb 16c, dis 10 %
Lake Superior, Slips (Chase).....₱ lb 30c, dis 10 %
Grindstones, Family, Loring's.....dis 10 %

Stove Polish.
Joseph Dixon's.....₱ gross $6.00, dis 10 %
Gem.....₱ gross $4.50, dis 10 %
Gold Medal.....₱ gross $6.00, dis 25 %
"Mirror".....₱ gross $6.00, dis 4 %
Ruby.....₱ gross $3.75, net
Rising Sun.....₱ gross $5.75, net
Dixon's Plumbago.....₱ lb 8c, net

Squares.
Steel.....dis 50 %; full cases, dis 40&10 %
Iron.....dis 50 %; full cases. dis 40&10 %
Nickel Plated.....add $2.40 @ $4.00 ₱ doz, net
Try Square and T Bevels.....dis 50&10 %
Disston's Try Square and T Bevels.....dis 40 %
Winterbottom's Try and Mitre.....dis 20&10 %

2% cash

Tacks, Brads, &c.
New List, Sept. 1, 1882.
Tinned Swedes Tacks.....dis 30 %
Tinned American Tacks.....dis 30 %
Swedes Tacks, all kinds.....dis 30 %
American Cut Tacks.....dis 30 %
Copper Tacks and Nails.....dis 30 %
Swedes Hungarian Nails.....dis 30 %
Gimp and Lace Tacks.....dis 30 %
Gimp and Lace Tacks, Tinned.....dis 30 %
Finishing Nails.....dis 20 %
Trunk and Clout Nails.....dis 20 %
Common and Patent Brads.....dis 20 %
Basket Nails.....dis 20 %
Brush Tacks.....dis 20 %
Leathered Carpet Tacks.....dis 20 %
Cigar Box Nails.....dis 20 %
Chair Nails.....dis 20 %
Double-pointed Tacks.....dis 40& 5%

Extra 10 % off all

Tap Borers.
Common and Ring.....dis 20 %
Ives' Tap Borers.....dis 15&10 %
Enterprise Mfg. Co.....dis 25 %

Tapes, Measuring.
American.....dis 20 %
Spring.....dis 25&10 %

Thermometers.
Tin Case.....dis 70&10 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion).....dis 25 %
Wood Bottom.....₱ doz $11.00, dis 20&10 %
All Iron.....₱ doz $8.25, dis 20&10 %
Nashua Lock Co.'s.....₱ doz $18.00 dis 40&5 %
Wilson's.....dis 35 %
Clipper (Sargent & Co.).....₱ doz $18.00. dis 20 & 10 %

Toe Calks.
Winsted.....₱ lb 9c, dis 5

Tinners' Tools and Machines.
Machines (P. S. & W.).....list add 20 %
Tools (P. S. & W.).....add 6 %

Transom Lifters.
Wollensak's Patent.....dis 35 %
Reiher's Patent, new list, Feb., 1882.....dis 20&10&10 %
Excelsior.....dis 50&10&2 %

Traps.
Game, Newhouse.....dis 35 %
Game, Oneida Pattern.....dis 55&5&60 %
Game, Blake's Patent.....dis 40 %
Mouse, Wood, Choker.....₱ doz holes, 16½c
Mouse, Round Wire.....₱ doz $1.50, dis 10 %
Mouse Cage, Wire.....₱ doz $2.50, dis 10 %
Mouse, Catch-em-alive.....₱ doz $2.50, dis 10 %
Rat, "Decoy".....₱ doz $10.00, dis 10 %

Trowels.
Lothrops' Brick and Plastering.....dis 25 %
Reed's Brick and Plastering.....dis 15 %
Disston's Brick and Plastering.....dis 20 %
Peace's Plastering.....dis 15 %
Clement & Maynard's.....dis 20 %
Rose's Brick.....dis 15 %
Brades' Brick.....dis 20 %
Worrall's Brick and Plastering.....dis 20 %
Garden.....dis 55 %

Triers.
Butter and Cheese.....dis 25 %

Trucks (Warehouse, &c.
Penfield Block Co.'s list, 1882.....dis 35 %

Vises.
Solid Box.....List of July 1, 79, dis 35 %
Solid "Crown" (A. H. Hildick).....40 to 100 lb, 15c net
Solid, Peter Wright's.....15½c
Solid, Wilkinson's.....13½c
Parallel, Parker's.....dis 10 %
Parallel, Wilson's.....dis 35&10 %
Parallel, Howard's.....dis 20&10 %
Parallel, Merrill's.....dis 15 %
Parallel, Sargent's.....dis 55 @ 60 %
Parallel, Backus and Union.....dis 40 %
Parallel, Oval Slide.....dis 40 %
Parallel, Double Screw Leg.....dis 15&10 %
Parallel, Prentiss.....dis 25 %
Parallel, Simpson's Adjustable.....dis 25 %
"Family," List.....Rust
Saw Filers, Bonney's.....₱ doz $24.00, dis 20&10 %
Saw Filers, Stearn's.....dis 20&10 %
Saw Filers, Hopkins'.....₱ doz $17.50, dis 10 %
Saw Filers, Reading.....dis 35&10 %
Cowell Hand Vises.....dis 20 %
Richardson's Vise and Anvil.....dis 25 %

Wasner Cutters.
Smith's Patent.....₱ doz $12.00, dis 25 %
Johnson's.....₱ doz $11.00, dis 33⅓ %
Penny's.....₱ doz $14.00 and $16.00, dis 55 %
Appleton's.....₱ doz $16.00, dis 60&10 %

Washers.—See Nuts and Washers.

Well Wheels.....dis 55&10 %

Wire.
Brass and Copper, list of June 10, 1882.....dis 50 %
Bright and Annealed.....Nos. 0 @ 18, dis 52 @ 52½ %
Bright and Annealed.....Nos. 19 @ 26, dis 52 @ 52½ %
Bright and Annealed.....Nos. 27 @ 36, dis 52 @ 52½ %
Coppered.....Nos 0 @ 18 dis 42 @ 42½ %
Galvanized, Nos. 0 to 18.....market list dis 40 @ 42½ %
Tinned, Nos. 9 to 18.....dis 45 @ 47½ %
Cast Steel.....dis 40 %
Tinned Broom Wire, Nos. 18 to 25.....dis 55 %
Annealed Fence, Nos. 8 & 9.....dis 55 @ 52½ %
Annealed Grape, Nos. 10 to 14.....dis 50 @ 52½ %
Galvanized Telegraph, Nos. 7 to 9.....₱ lb 7½c
Galvanized Telegraph, Nos. 10 to 11.....₱ lb 8½c
Galvanized Telegraph, No.....₱ lb 10½c
Fence Staples.....₱ lb 5½ @ 5½c
Fence Staples, Galvanized.....₱ lb 7 @ 7½c
Stubs Steel Wire.....$6.00 to £ dis 30 %
Japanned Barb Fence.....₱ lb 8½c
Galvanized Barb Fence.....₱ lb 9½c
Steel Music Wire, Nos. 7 to 30.....75c ₱ lb
Turner & Seymour Mfg Co., Picture Wire, low list.....dis
Judd's Picture Wire.....dis 40 %
Clothes Line Wire, Galvanized.....₱ coil 24 @ 40c net
Wire Cloth, green, drab and black...₱ sq. ft., 2½c net

Wrenches.
American Adjustable.....dis 45 %
Baxter's Adjustable "S," list Jan., 1880.....dis 20&5 %
Baxter's Diagonal.....dis 20&5 %
Coes' Genuine.....dis 40&10 %
Coes' "Mechanics".....dis 40&10&10 %
Coes' Pattern, Malleable.....dis 75 %
Coes' Pattern Wrought.....dis 60 @ 65 %
Girard Standard.....dis 60&10 %
Girard Agl.....dis 60&10 %
Bemis & Call's Patent Combination.....dis 20 %
Bemis & Call's Merrick's Pattern.....dis 35 %
Bemis & Call's Brigg's Pattern.....dis 35 %
Bemis & Call's Cylinder or Gas Pipe.....dis 40 %
Van Wagoner & Williams' Basin.....₱ doz $4.50
Aiken Pocket (Bright).....$6.00, dis 50&10 %
The Favorite Pocket (Bright).....₱ doz $8, dis 60 %
Webster's Patent Combination.....dis 25 %

Wringers.

	Per doz.
Universal, XX, No. 2½	45.00
Universal, XX, No. 2	40.00
Universal, XX, No. 1½	54.00
Universal, XX, No. 1	50.00
Universal, XX, No. 0	each 10.75
Universal, XX, No. 12	each 20.25
Universal, XX, No. 16	each 22.75
Universal, XX, No. 22	each 30.25
Peerless, no Cogs, No. 3	42.00
Peerless, with Cogs, No. 2½	45.00
Peerless, with Cogs, No. 2	48.00
Peerless, with Cogs, No. 3	54.00
Peerless, with Cogs, No. 4	66.00
Eureka, No. 2	₱ doz 42.00

NEW YORK WHOLESALE PRICES, November 29, 1882.

METALS.

IRON.—DUTY. Bars, 1 to 1½c. ₩ ℔; Sheet, Band Hoop and Scroll, 1¼ to 1½c. ₩ ℔; provided, that none of the above Iron shall pay a less rate of duty than 25 per cent. Pig, $7 ₩ ton; Polished Sheet, 3c. ₩ ℔; Wrought Scrap, $8 ₩ ton; Cast Scrap, $6 ₩ ton. Railroad, 70c. ₩ 100 ℔. Boiler and Plate, 1½c. ₩ ℔.

American Iron.		
Foundry, No. 1X	₩ ton	$25.00 @ 26.00
Foundry, No. 2X	₩ ton	23.00 @ 24.00
Gray Forge	₩ ton	20.00 @ 21.00
Scotch Iron.		
Eglinton	₩ ton	22 00
Carnbroe (to arrive)	₩ ton	23.00 @ 24.00
Coltness	₩ ton	26.50 @ 27.00
Glengarnock	₩ ton	23.00 @ 24.00
Gartsherrie	₩ ton	20.00
Langloan	₩ ton	26.50
English Iron.		
Redcar No. 1	₩ ton	21.00 @ 22.00
Rails.		
Iron	₩ ton	Nominal.
Steel, at Eastern mills	₩ ton	40.00
Old Rails Ts	₩ ton	27.00
Old Rails D R	₩ ton	29.00
Scrap.		
Wrought Scrap ₩ ton, from yard		27 00
Steel Crop Ends		24.50 @ 25.00
Bar Iron from Store.		
Common Iron ⅜ to 1 in. round and square; 1 to 6 in. x ⅜ to 1 in.	₩ ℔	@ 2.5c
Refined Iron: ⅜ to 2 in. round and square; 1 to 6 in. x ⅜ to 1 in.; to 6 in. x ½ and 5-16	₩ ℔	2.7
Rods—⅜ and 11-16 round and square	₩ ℔	2.9
Bands—1 to 6x5-16 to No. 12	₩ ℔	3.1
Norway Nail Rods		4¼ @ 4½c

Sheet Iron.

	Common American	R. G. American.
Nos. 10 to 20	₩ ℔ 4 c	4 c
21 to 24	₩ ℔ 4¼c	4¼c
25 to 26	₩ ℔ 4½c	4½c
27	₩ ℔ 4¾c	4¾c
28	₩ ℔ 5 c	4¾c

	B. B.	2d qual.
Galvanized, 10 to 20	₩ ℔ 8 c	7 c
Galvanized, 21 to 24	₩ ℔ 8½c	7½c
Galvanized, 25 to 26	₩ ℔ 9½c	8 c
Galvanized, 27	₩ ℔ 10¼c	8½c
Galvanized, 28	₩ ℔ 11 c	9 c
Patent Planished "A"	₩ ℔ 10½c	B. 9½c
Russia	₩ ℔ 11¼ @ 12 c	
American Cold Rolled	₩ ℔ 5 c @ 7½c	

COPPER.—DUTY: Pig, Bar and Ingot, 5c; Old Copper 4c ₩ ℔; Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.

American Ingot ₩ ℔ See Trade Report.

SHEATHING BRAZIERS COPPER, BOLTS, &C.

Brazier's Copper, ordinary sizes, 16 oz. per sq. ft., and over ₩ ℔ 30c

Braziers' Copper, ordinary sizes, under 16 oz. and over 12 oz., ₩ sq. ft. ₩ ℔ 32c

Braziers' Copper, 10 oz. and 12 oz., ₩ sq. ft. ₩ ℔ 34c

Braziers' Copper, Lighter than 10 oz. ₩ sq. ft. ₩ ℔ 36c

Circles less than 24 in. in diameter ₩ ℔ 33c

Circles 24 in. diameter and over ₩ ℔ 30c

Segment and Pattern Sheets ₩ ℔ 33c

Locomotive Fire Box Sheets ₩ ℔ 30c

Sheathing Copper, over 12 oz. ₩ sq. ft. ₩ ℔ 26c

Bolt Copper ₩ ℔ 30c

Copper Bottoms ₩ ℔ 31 @ 32c

No Copper is Sheathing except 14X40 inches, and not to exceed 14 oz. to the sq. ft.

TINNING.

Sheets 14 x 48 ₩ sheet 6c

All other size Sheets, 3 50c ₩ sq. ft.

For tinning both sides, double the above amount.

O'NEILL'S PATENT PLANISHED COPPER.—Net.

14X48

and 16 oz. and heavier ₩ ℔ 37c By the case ₩ ℔ 36c

oz. and lighter ₩ ℔ 40c " " ₩ ℔ 39c

Boiler Sizes.

9 in., 14X42. 8 in., 14X46. 9 in., 14X60.

and 16 oz. and heavier ₩ ℔ 39c By the case ₩ ℔ 38c

(And all sizes not over 20 in. wide.)

24X48 30X60.

and 16 oz. and heavier ₩ ℔ 42c

and ₩ ℔ 45c

BRASS.

Brown & Sharp's Gauge the Standard for Metals. Old English Gauge the Standard for Wire.

BRASS MANUFACTURERS' PRICE LIST.—dis. 30 %.

June 10, 1882.

Cash prices for Rod and Sheet Brass. For less quantities than 100 ℔ add 3c. ₩ ℔.

HIGH BRASS.

All Nos. not thinner than 10 No. 28, wider than 2 in., not wider than 14 in. .50c

All Nos. to No. 28, inclusive, and widths over 14 to 20 in., inclusive .35c

All Nos. to No. 28, inclusive, and widths over 20 to 30 in., inclusive .38c

½c. ₩ ℔ advance on each No. above Nos. 26 to 36, inclusive.

All brass thinner than No. 36 is Platers' Brass, at ...43c

Sheets 24x48, and all sheets cut to particular sizes and lengths under 30 in. in width wider than 2 in. 37c

Printers' Rules .45c

Sheets wider than 30 in. and under 40 in. .47c

" 40 in. and over .50c

Circular Sheets, in diam. from 4 in. to 14, inclusive..40c

" " over 14 " 20 " .45c

" " " 20 " 30 " .49c

" " " 30 " 40 " .52c

" " " 40 in. .59c

LOW BRASS.

c ₩ ℔ more than High Brass.

Gilding Metal, 8c ₩ ℔ more than High Brass.

Platers' or Gold Metal { In Bars .40c; Sawed .42c; Planed or Polished .54c

FOR SLITTING.

Metal, in width 1 in. to ⅛ in. to No. 28, inclusive, 1c ₩ ℔ advance.

Metal, in width 2 in. to 1 in. thinner than No. 28, 2c ₩ ℔ advance.

Metal, in width 1 in. to ⅛ in. thinner than No. 28, 3c ₩ ℔ advance.

Metal in width ¼ in. to ¼, inclusive, not thinner than No. 28, 2c ₩ ℔ advance.

Metal, in width ⅛ in. to ¼ thinner than No. 28, 4c ₩ ℔ advance.

Metal, ¼ in. in width and less, 10c ₩ ℔ advance.

Any of the above widths cut to particular lengths, add 20 ₩ ℔.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire
4 per cent., 12 inch to No. 26	$0.52	$ .72
6 " " "	.56	.76
10 " " "	.64	.84
15 " " "	.74	1.03
18 " " "	.83	1.13

German Silver Sheets over 14in. wide and weighing more than 10 ℔., $2 ₩ ℔.

Advance 2c. for each additional inch in width above 12 in. and 2c. ₩ ℔ on each No. thinner than Nos. 26 to 36, inclusive.

All German Silver thinner that No. 36 is Platers', at 50c. ₩ ℔ additional.

German Silver Scrap, one-half less than net price of 12in. Market Metal. German Silver Turnings, Filings and Chips, half the price of Scrap.

BRASS AND COPPER WIRE.

	High Brass.	Low Brass.	Gild'g and Copper.
No. 6 to 20	$0.33	$0.37	$0.46
No. 21	.36	.40	.46
No. 22	.37	.41	.47
No. 23	.38	.42	.48
No. 24	.40	.44	.50
No. 25	.43	.47	.53
No. 26	.45	.49	.55
No. 27	.48	.52	.58
No. 28	.52	.56	.63
No. 29	.55	.59	.65
No. 30	.58	.62	.72
No. 31	.62	.66	.78
No. 32	.66	.70	.84
No. 33	.70	.74	.93
No. 34	.74	.78	1.03

Spring Wire 2c. ₩ ℔ advance

Flat Square and Half-Round Wire 5c ₩ ℔ advance on Round Wire.

Fancy Wire not less than 10c ₩ ℔ advance on Round Wire.

Brass Rods, No. 8 and larger, not less than 2 feet lengths, 38c.

Wire straightened and cut smaller than No. 8 and not less than 2 feet lengths, 45c.

Wire and Rods less than 2 feet lengths, special rates.

Twelve cents per ℔ extra for spooling on 1 ℔ spools to No. 36.

MISCELLANEOUS.

Brass Pail Ears .$0.60

Brass Door Rail .45

SCRAP—Net.

High Brass Scrap .12c

Low Brass Scrap .14c

Gilding .16c

Turnings, Filings and Chips half the price of Scrap.

Terms—Net cash. Interest to be added after thirty days.

TUBING.—dis. 25 %. ₩ ℔

No 20 inclusive above ¼ in. to 3 in. .$0.42

Plain above 3 in. .42

Nos. 21, 22, 23, two cents advance on List for each Number.

Nos. 24, 25, 26, four cents advance on List for each Number.

Above No. 26, special rates.

Plain, ¼ inch .70

Plain, 5-16 inch .1.10

Plain, ½ inch .1.60

All Mandrel Drawn Tubes, 4 cents advance on List Prices.

Fancy Tubing to No. 20 .40

English, Scotch and Extra Patterns Fancy Tubing to No. 20 .55

Tubing sawed or Cut 2 to 4 feet long, 2 cents advance on List.

Add two cents, ½ cent for each additional cutting under 2 feet.

All Mandrel Drawn Tubes under ¾ in. 25 cents per pound advance.

ZINC TUBING—dis. 25 %.

Plain	27
Fancy	33
Scotch and Extra Patterns	30

GERMAN SILVER TUBING.—dis 25 %.

4 Per cent.	.80
6 Per cent.	.97
9 Per cent.	1.00
12 Per cent.	1.20
15 Per cent.	1.35
16 Per cent.	1.45
18 Per cent.	1.50
7 Per cent.	1.60

STEEL.—DUTY: Bars, Ingots, Sheets and Coils, valued at 7c ₩ ℔, or under, 2½c; over 7c and not above 11, 9c ₩ ℔; over 11, 3½c ₩ ℔, and 10 % ad val. Railway Bars, 1¼c ₩ ℔. Railway Bars, in part Steel, 10 ₩ ℔. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as

American Cast Steel.

For American Steel see quotations under heading of Pittsburgh.

English Steel.

Best Cast	₩ ℔ 15½c
Extra Cast	₩ ℔ 16½c
Round Machinery, Cast	₩ ℔ 10c
Swaged, Cast	₩ ℔ 18c
Best Double Shear	₩ ℔ 13½c
Blister, 1st quality	₩ ℔ 13c
German Steel, Best	₩ ℔ 11c
2d quality	₩ ℔ 10c
3d quality	₩ ℔ 9c
Sheet Cast Steel, 1st quality	₩ ℔ 18½c
2d quality	₩ ℔ 14½c
3d quality	₩ ℔ 12½c

ANTIMONY .See Trade Report

LEAD.—DUTY: Pig, $2 ₩ 100 ℔ Old Lead, 1½c ₩ ℔ Pipe and Sheet, 2½c ₩ ℔.

American	5 @ 5½c
Bar	6½c. net
Pipe	7½c, dis 10 %
Tin Lined Pipe	11c, dis 10 %
Sheet	8c, dis 10 %
Shot	Drop 7c, Buck, 8c
Chilled Shot	8c

BABBITT METAL.

N. P. U	₩ ℔ 9c
A. 28c; B. 22c; C. 14c	

TIN.—DUTY. Plates, Sheets Tagger and Terne, 1.1c ₩ ℔; Electro-galvanized Plates, 2c ₩ ℔; Manufactures of, not enumerated, 35 per cent. ad val. Bars, Block and Pigs free. Banca, subject to duty of 10 per cent.

Banca	₩ ℔ 28½ @ 29c
Straits	₩ ℔ 25
English	₩ ℔ 25

TIN PLATES.

	Best.	Ordinary
IC 10X14 / I C 14X20 } Prime Charcoal	$6.25 @ 6.75	
I C 12X12 Prime Charcoal	6.75	
IC 10X14 / I X 14X20 } Prime Charcoal	8.25	
I X 12X12, Prime Charcoal	8.50	
D C 12½X17, Prime Charcoal	6.00 @ 6.25	
D X 12½X17, Prime Charcoal	8.25	
For each additional X add	2.00	

COKE TIN PLATE.

	Best.	Ordinary
I C 10X14 / I C 14X20 }	$4.75	$4.25 @ 4.50
I C 12X12	5.00	5.50 @ 5.75

TERNE PLATE.

	Prime Char.	2d Qual.	Coke.
I C 14X20	$4.50 @ 5.75	5.37½ @ 5.50	5.25 @ 5.37½
I X 14X20	7.50	....	....
I C 20X28	11.50	11.00 @ 11.25	10.75 @ 11.00
I X 20X28	14.50	....	....
I C 20X20	10.50	....	....
I C 14X20 M. F. Brand	$7.50		

SOLDER—½ & ½ .18c

Extra .14½c

No. 1 .13c

SPELTER.—DUTY: In Pigs, Bars and Plates, $1.50 ₩ 100 ℔.

American, cash	6

ZINC.—DUTY Pig or Block, $1.50 ₩ 100 ℔; Sheet 2½c ₩ ℔.

Sheet, Cask	6¾ @ 7 c
Sheet, Open	7¼ @ 8 c

Paper Stock, &c.

(Dealers' Selling Prices.)

	Cents ₩ ℔
White Shirt Cuttings, No. 1	7½ @
White Shirt Cuttings, No. 2	5 @ 5½
Mill Assorted Whites	3½ @ 4½
Unbleached Muslins	6½ @ 6¾
City Whites, No. 1	4¾ @ 5
New Canton Flannels	@ 6¼
New Seconds, light	3¾ @ 3¾
New Seconds, dark	3 @ 3¼
No. 2 Whites	2½ @ 2¾
Cotton Canvas	4½ @ 4¾
Linen Canvas, No. 1	4¾ @ 4½
Seconds, City No. 1	1¾ @ 1¾
Seconds, City No. 2	1¾ @ 1¾
Colors, per 100 ℔	50 @
Manila Rope	3½ @ 3¾
Manila Rope, Tarred	2¾ @ 2¾
Gunny Bagging, No. 1	2¾ @ 2½
Gunny Bagging, No. 2	1¾ @ 1½
Kentucky Bagging	4½ @ 4¾
Burlap Bagging, No. 1	2¾ @ 2¾
Tar Shakings	2 @ 2¼
Hemp Twine Stock	4¼ @ 4¾
Hard White Shavings, No. 1	4 @ 4¼
Soft White Shavings, No. 1	3¼ @ 3½
White Shavings, No. 2, soft	@ 3¼
Mixed Shavings, part white	2½ @ 3
Ledger and Writing	3¼ @ 3¾
Solid Stock	2¾ @ 3
Book Stock, No. 1, light	1¾ @ 1¾
Old Newspapers	1¼ @ 1¾
Pure Manilas	2½ @ 2¾
Bagus Manilas and Hardwares	1 @ 1½
Commons per 100 lbs	70 @ 80
Binders' Board Cuttings	1½ @ 1¼
Straw Board Cuttings	¾ @ 1

Paints, Oils, &c.

Paints.

Black Lamp, Coach Painters	₩ ℔ 20c
Black Lamp, Ordinary	₩ ℔ 6c
Black Ivory Drop, fair	12 @ 15c
Black Ivory Drop, best	20c
Black Paint, in oil	Kegs 8c; asst'd cans, 11c
Blue Prussian, fair to best	40 @ 50c
Blue Prussian, fair to best, in oil	45 @ 55c
Blue Chinese dry	70c
Blue Ultramarine	18 @ 30c
Brown, Spanish	1½c
Brown, Van Dyke	10 @ 12c
Green, Chrome	15 @ 23c
Green, Chrome, in oil	14 @ 18 @ 25c
Green, Paris	Good, 25c; best, 30c
Green, Paris, in oil	Good, 30c; best, 45c
Iron Paint, Bright Red	₩ ℔ 2½c
Iron Paint, Brown	₩ ℔ 1½c
Iron Paint, Purple	₩ ℔ 3
Iron Paint, Ground in oil, Bright Red	₩ ℔ 3½c
Iron Paint, Ground in oil, Red	₩ ℔ 5 c
Iron Paint, Ground in oil, Brown	₩ ℔ 4½c
Iron Paint, Ground in oil, Purple	₩ ℔ 6 c
Mineral Paints	2 @ 4c
Orange Mineral	12c
Red Lead, American	7½c
Red Venetian (Eng.) dry	$1.06 @ $1.75
Red Venetian, in oil	asst'd cans, 11c; kegs, 8c
Red Indian dry	9 @ 12c
Rose Pink	10 @ 13c
Sienna, American, Raw	4c
Sienna, Burnt	4½c
Sienna, Burnt, in oil	10 @ 15 @ 20c
Sienna, Raw	11 @ 15 @ 25c
Umber, Burnt	4 @ 8c
Umber, Burnt, in oil	9 @ 12 @ 15c
Umber, Raw	3½ @ 7½c
Umber, Raw, in oil	10 @ 15 @ 45c
Vermilion, Chinese	90c
Vermilion, English	46 @ 48c
Vermilion, American, Common	14c
White Lead, American, pure dry	7c
White Lead, American, pure in oil	7 @ 7½c
White, Paris, English, prime	in bbls. 2 @ 2 c
Yellow Ochre, French	$1.75
Yellow Ochre, French, in oil	asst'd cans, 11c; kegs, 8c
Yellow Ochre, Vermont	In casks, 1½c
Yellow Chrome	17 @ 27c
Yellow Chrome, in oil	14 @ 18 @ 25c
Zinc White, American No. 1, dry	5 @ 6c
Zinc White, American No. 1, in oil	9c
Zinc White, French (Paris) dry	8 @ 10c
Zinc White, French, in oil	10 @ 13c

Oils.

Linseed, Raw, in casks and bbls	gal. 53c @ 55c
Linseed, Boiled, in casks and bbls	gal. 56c @ 58c
Bleached Whale	₩ gal. 68c
Bleached Sperm	₩ gal. $1.32
Bleached Elephant	75c
Signal	80c
Prime Lard	$1.00
No. 1 Extra	80c
West Virginia	12c @ 15c
Drilling	40c
Miners' Oil	42c @ 46c
Fish Oil, pressed	45c @ 46c
Neatsfoot	80c @ 90
Tallow	70c @ 75c
Empire Cylinder Oil	60c
Machinery	40c
Engine	50c

Sundries.

Mineral Wool, ordinary	₩ ℔ 1 @ 1½c
Mineral Wool, extra	₩ ℔ 2 @ 2½c
Asphaltum Cuban	50 @ 8c
Asphaltum Egyptian	85c @ 90
Benzine	₩ gal. 80 @ 100
Chalk	80c
Chalk, Block	90c
Dry or Patent Ass'n	Ass'd cans, 90; keg
Frostings	40c
Glue, White	24 @ 30c
Glue, Sheet	20c
Glaziers' Points, Zinc	8c
Gum, Copal	36c
Gum, Damar	25c
Gum Shellac, English	40c
Gum Shellac, English, dark	30c
Litharge	7½c
Pumice Stone, selected Lumps	4 @ 5c
Pumice Stone, Powdered	3½c
Pine Tar, bbls	$3.25
Pitch	$2.25
Putty, in bladders	3 c
Putty, in bulk	2½c
Rosin—Common and Good—Strained	$2.15
E & F	$2.25
G & H	$2.80 @ $2.90
I & K	$3.10 @ $3.20
M & N	$3.80 @ $4.10
Spirits Turpentine	51½c @ 52½c
Whiting Spanish	3½c
Waste, No. 1 Cop	10c
Waste, No. 1 White Machine	10c
Waste, No. 2 White Machine	9½c
Waste, No. 1 Colored	7c
Waste, No. 2 Colored	6½c
Waste, Washed Machine	9

Glass.

Prices current per box of 50 feet.

List, January 17, 1882.

Single Thick.

SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$10.00	$ 9.25	$ 9.00	$ 8.50
11 x 14 to 16 x 24	11.50	10.75	10.25	9.25
18 x 22 to 20 x 30	14.75	13.75	12.50	11.50
15 x 36 to 24 x 30	16.50	14.75	13.00	
26 x 28 to 24 x 36	17.50	16.00	14 00	
26 x 36 to 26 x 44	18.75	17.25	14.50	
26 x 46 to 30 x 50	20.50	19.25	16.50	
30 x 52 to 30 x 54	22.75	21	18.00	
30 x 56 to 34 x 5	24.00	22	19.75	
34 x 58 to 34 x 60	25.25	23.75	21.50	
36 x 60 to 40 x 60	28.50	26.00	23.75	

Double Thick.

SIZES.	1st.	2d.	3d.	4th
6 x 8 to 10 x 15	$13.00	$12.25	$11.75	$11.00
11 x 14 to 16 x 24	15.75	14.75	14.00	
18 x 22 to 20 x 30	20.00	18.50	17.00	
15 x 36 to 24 x 30	22.00	20.00	17.75	
26 x 28 to 24 x 36	24.00	22.50	19.25	
26 x 36 to 26 x 44	25.00	23.50	20.00	
26 x 46 to 30 x 50	27.00	25.25	22.00	
30 x 52 to 30 x 54	30.00	28.00	24.00	
30 x 56 to 34 x 56	31.50	29.00	26.25	
34 x 58 to 34 x 60	33.00	31.00	28.50	
36 x 60 to 40 x 60	37.00	34.00	32.00	

Sizes above—$15 per box extra for every 5 inches. An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches will be charged in the 81 united inches bracket.

Discount, 60 and 20.

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ONE-MAN CROSS-CUT SAWS,

With Atkins's Patent Double Handle

Attached, as shown in the accompanying cuts.

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N. B.—We are the Original and Sole Makers of Silver-Steel Circular and Cross-Cut Saws.

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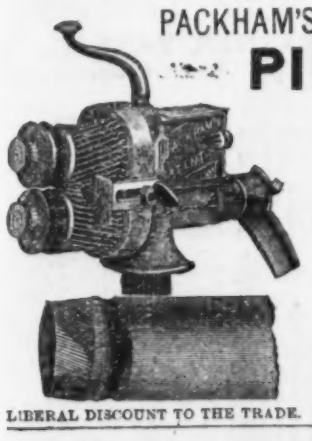
PIPE CRIMPER.



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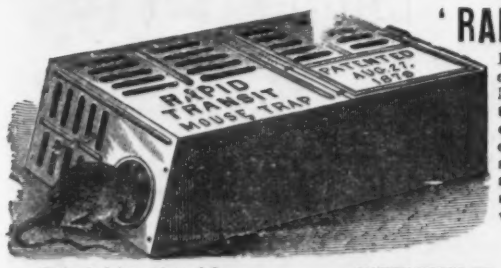
THE

'RAPID TRANSIT' TRAP



Has no superior, and is a sure and certain catcher of Mice. With the Metal Platform resting on wood bottom of Trap, an invitation is always extended to Mice of whatever "kind, color or condition of race," into secure and grated quarters, from which they are released by opening cover of Trap and depositing contents into a pail of water.

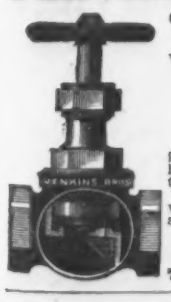
The Mice go in at a rapid rate,
And each one sets it for his mate.

Patented August 27, 1878. MANUFACTURED BY

THE SMITH & EGGE MANUFACTURING CO., Bridgeport, Conn.

Agents FLAGER, FORSYTH & BRADLEY, 298 Broadway, New York.

JENKINS PATENT VALVES.



GATE, GLOBE, ANGLE, CHECK AND SAFETY.

Manufactured of Best Steam Metal.

We claim the following advantages over all other Valves and Gauge Cocks now in use

1.—A perfectly tight Valve under any and all pressures of steam, oils or gases.
2.—Sand or Grit of any kind will not injure the seat.
3.—You do not have to take them off to repair them.
4.—They can be repaired by any mechanic in a few minutes.
5.—The elasticity of the Disc allows it to adapt itself to an imperfect surface.

In Valves having ground or metal seats, should sand or grit get upon the seat it is impossible to make them tight except by regrinding, which is expensive if done by hand, and if done by machine soon wears out the valve, and in most cases they have to be disconnected from the pipes, often costing more than a new valve.

The Jenkins Disc used in these Valves is manufactured under our 1880 Patent and will stand 200 lbs. steam. Sample orders solicited. All Valves sold by us are warranted and are stamped.

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Adapted for the use of **Boys, Youths, Gentlemen, Farmers, Planters, Carpenters, Railroads and Mines**; fitted up complete with a superior quality of **Tools**, and suited to the wants of the **Hardware, Toy, Notion and Variety trades. Export trade** solicited, **and a full stock of large-sized Chests always on hand.** Quality considered, we think our goods will be admitted by buyers the cheapest that have yet been offered by any manufacturer in the United States or Europe. **Illustrated descriptive catalogue** furnished free on application with prices.

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LUSTRO METAL POLISH

HAS BEEN THOROUGHLY TESTED AND UNIVERSALLY APPROVED as a means of quickly and without labor restoring and preserving unsullied the brightness of **Silverware, Jewelry, Nickel Stove Plates, Plated Ware, Show Cases, &c.**

LUSTRO STOVE POLISH,

IS COMPOSED OF THE VERY BEST MATERIALS; will black more stoves in a given length of time than any other polish now on the market. It produces a dark, brilliant polish, is free from dust, and gives satisfaction every time. After a trial you will buy no other.

LUSTRO METAL POLISH put up in 4 oz. Bottles, 1 Doz. in Case.

LUSTRO STOVE POLISH packed in Patent Cans, and Attractively Labeled.—1 and 5 lb. cans for Stove Dealers and Manufacturers; 3 oz Tins in ¼ gro. Box for Household use.

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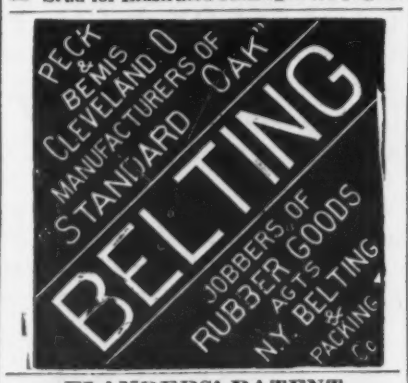

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Descriptive Circular on application.

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AMERICAN MEAT CHOPPER,

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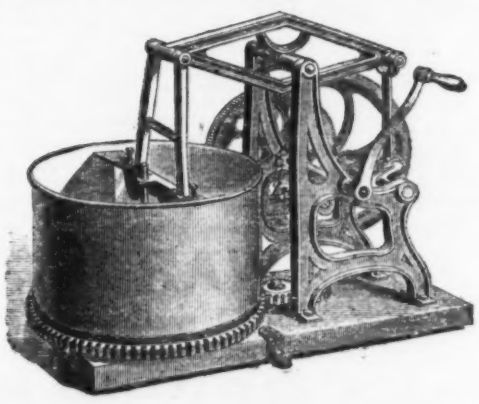

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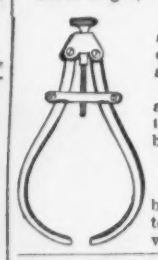
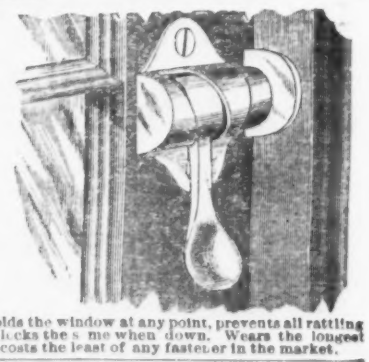


The movement is obtained by a thumb-screw acting upon a cross-bar, which slides backward and forward over the caliper legs

The movement of the screw is about one to four of the caliper, thus the action of the caliper is both rapid and positive.

Patented Dec. 20th, 1881.

Excels all other Calipers, not being dependent on a spring at top. Is as strong wide open as when partially closed.



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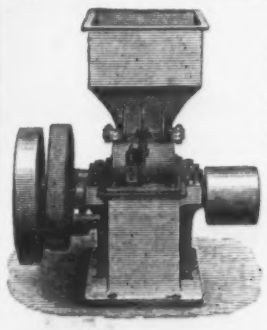

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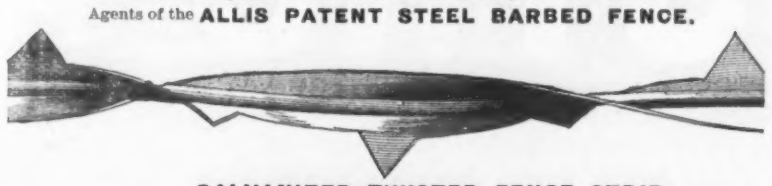

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Solid Steel Mining and Railroad Picks, Blacksmith's Sledges, Striking Hammers, Woodchopper's Wedges and Sledges,

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A. Pardee & Co. { HAZLETON. CRANBURY. SUGAR LOAF.

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Pardee, Sons & Co. MT. PLEASANT.

THE "EAGLE" ANVIL.

LATEST PATENT APRIL 24, 1877.

ESTABLISHED 1843.

SOLD BY

WARRANTED!!

Better than the Best English Anvil.

Face in one piece, of BEST TOOL CAST STEEL. PERFECTLY WELDED, perfectly true; of hardest temper and never to come off or "settle." It does not bounce the hammer back, and therefore can do more work with lighter hammer. Horn of tough *untempered steel*, never to break or bend. *Only Anvil made in United States fully warranted as above. None genuine without our trade-mark.*

N. B.—That the *"Eagle" Anvil* is the *only* one made at Trenton, New Jersey, and it must not be mistaken for an Anvil in the market called Trenton, but which is really of foreign manufacture, and an imported imitation of the English Anvil.

New York—RUSSELL & ERWIN MANUFACTURING COMPANY, DURRIE & McCARTY, TENNIS & WILSON.
Philadelphia—JAMES C. HAND & CO. *Boston*—GEORGE H. GRAY & DANFORTH.
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Prouty's Patent PEERLESS FORCE PUMP.

Has Self-Adjustable Foot Rest.

NEW AUTOMATIC COMPENSATING PACKING.

It will throw a continuous jet FROM FORTY TO SIXTY FEET. A new pattern jet and spray nozzle is sent with each pump.

Especial attention is called to the material and workmanship exhibited in these pumps.

LIST PRICE, $8.

THE NEW ENGLAND BUTT CO
PROVIDENCE, R. I.

PHILADELPHIA SCREW CO., Limited,

Twelfth and Buttonwood Streets, PHILADELPHIA.

Manufacturers of

IRON & BRASS WOOD SCREWS.

Quality, finish and tests as to strength guaranteed equal to any in the market.

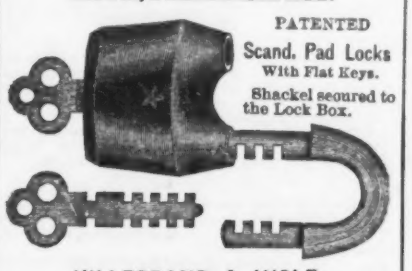
With improved facilities and largely increased capacity for production, we can fill orders promptly, and invite inquiries for discounts. A full line in stock.

STAR LOCK WORKS.

ESTABLISHED 1836.

Trunk Locks, Pad Locks, Dead Latches, Door Springs, Trunk Stays, Keys, &c., &c.

110 South 8th St., and Sansom, bet. 8th and 9th, PHILADELPHIA.



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Scand. Pad Locks
With Flat Keys.
Shackel secured to the Lock Box.

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J. STEVENS & CO.,

Chicopee Falls, Mass., P. O. Box 224,

Manufacturers of

Spring Calipers and Dividers,

Also, Surface Gauges and Counter Sinks, Stevens' Patent Breech-Loading Sporting Rifles, double and single barrel; Shot Guns, Pocket Rifles, Pocket Pistols, and the noted Hunters' Pet Rifles. Our

SHOOTING GALLERY RIFLE

Is the favorite everywhere.

FIRE SAND AND CLAYS.

MOULDING SAND.

Albany Sand a Specialty.

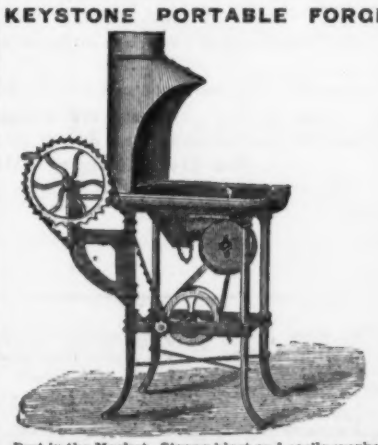
FOUNDRY FACINCS,

Shovels, Riddles, Brushes, &c.

WHITEHEAD BROS.
AMERICAN FACING CO.

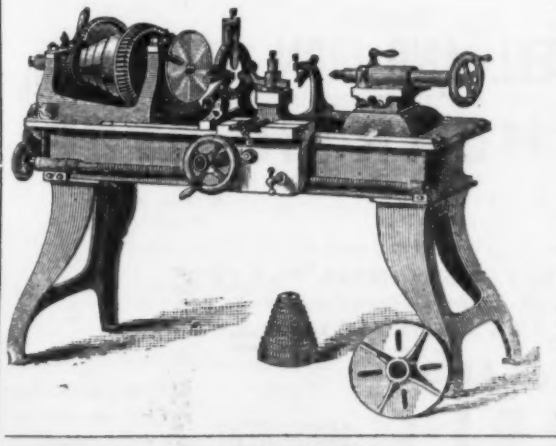
WM. WHITEHEAD, Treas.,
517 W. 15th St.,
New York.

KEYSTONE PORTABLE FORGE.



Best in the Market. Strong blast and easily worked, durable, and give entire satisfaction. All sizes for every kind of work. Also PRESSURE BLOWERS and EXHAUSTERS. Send for catalogue.

KEYSTONE PORTABLE FORGE CO.,
204 North Fourth Street, Philadelphia, Pa.



Israel H. Johnson, Jr., & Co.

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Manufacturers of

ENGINE, BRASS FINISHERS', WOOD TURNERS', AMATEURS' and JEWELERS' LATHES.

Slide Rest, Screw Machines, Turret Heads, Screw Presses, Screw Clamps, Lathe Carriers, &c.

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Israel H. Johnson, Jr. *Joshua R. Johnson, Jr.*

MORSE TWIST DRILL AND MACHINE CO.

NEW BEDFORD, MASS., Sole Manufacturers of

Morse Patent Straight-Lip Increase Twist Drill,

Beach's Patent Self-Centering Chuck, Solid and Shell Reamers,

BIT STOCK DRILLS,

DRILLS FOR COES, WORCESTER, HUNTER AND OTHER HAND DRILL PRESSES. BEACH'S PATENT SELF-CENTERING CHUCKS, CENTER AND ADJUSTABLE DRILL CHUCKS, SOLID AND SHELL REAMERS. DRILL GRINDING MACHINES. TAPER REAMERS, MILLING CUTTERS AND SPECIAL TOOLS TO ORDER.

All Tools exact to Whitworth Standard Gauges.

GEO. R. STETSON, Supt. EDWARD S. TABER, Treas.

BEECHER & PECK,

Successors to Milo Peck, Manufacturers of

PECKS DROP PRESS

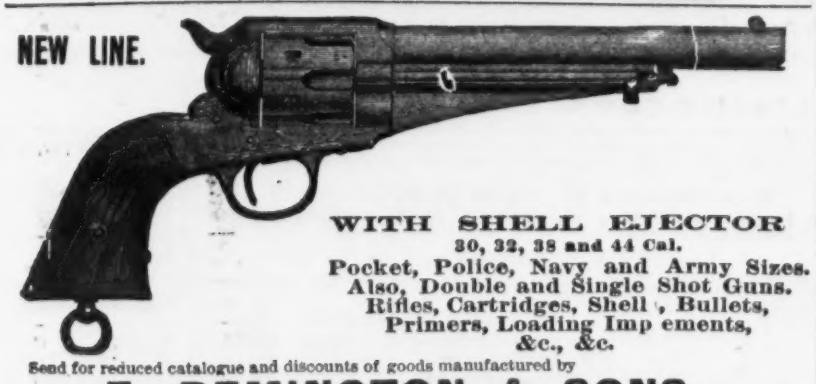
PECK'S DROP LIFTER is the only one which has its parts cushioned. Being thus cushioned they are the most durable Lifter in the market.

Can be attached to any drop now in use.

Send for Illustrated Catalogue.

Cor. Lloyd and River Sts., **New Haven, Conn.**

NEW LINE.



WITH SHELL EJECTOR
30, 32, 38 and 44 Cal.
Pocket, Police, Navy and Army Sizes.
Also, Double and Single Shot Guns.
Rifles, Cartridges, Shells, Bullets,
Primers, Loading Imp ements,
&c., &c.

Send for reduced catalogue and discounts of goods manufactured by

E. REMINGTON & SONS,

283 Broadway. - - - - NEW YORK.

New Furniture Spring Machine.
Patent Applied For.

This Furniture Spring Machine requires the attention of only one workman, and is capable of turning out from 2500 to 3000 pounds of first-class Furniture Springs in 10 hours. For particulars in regard to delivery of these machines and transfer of patents (as soon as obtained) apply to the Inventors.

CUST. DEUTGEN & CO.,
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SANDS' TRIPLE MOTION WHITE MOUNTAIN ICE CREAM FREEZERS.

THE WHITE MOUNTAIN FREEZER COMPANY are headquarters for Ice Cream Freezers and Ice Crushers, being the only firm in the United States who manufacture all parts of the raw material. The Examining Committee, consisting of 50,000 Citizens of the United States, have recommended the *Sands' Triple Motion White Mountain Freezer* to all persons in the world, for the following reasons: We have used them; they freeze quicker than any other; they save time, salt and ice; the triple motion makes smooth cream without bunches; makes more of it; galvanized iron outside; tin inside; no zinc in contact with the cream; easily adjusted; substantially made; simple in construction; perfect in results. Send for descriptive circular and discount of this celebrated Freezer.

Address,

HAND FREEZER. 2 to 25 qts. $3.50 to $25.00
HAND OR POWER. 25 and 50 qts. $75.00 and $175.00
HAND OR POWER ICE CRUSHER. $75.00

White Mountain Freezer Co.,
Nashua, N. H., U. S. A.

SPECIAL ATTENTION GIVEN TO EXPORT ORDERS.

A. F. PIKE.

Pike Station, - - New Hampshire,

Manufacturer and Wholesale Dealer in

Bluestone

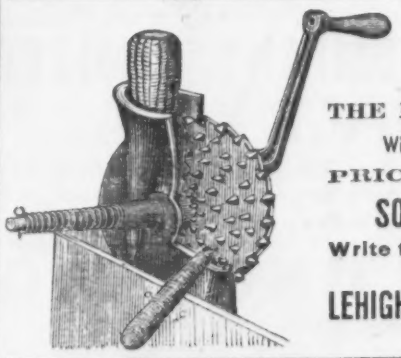
For Scythes, Axes, Knives and Turpentine Hacks.

Factories at Pike Station, N. H., and Evansville & Westmore, Vt.

Genuine Old Reliable,
Indian Pond (Red End),
Premium, Union,
White Mountain,
Letolle, Hacker,
Diamond Grit,
The New Boss,
Lamoille, Rags,
Willoughby Lake,
Green Mountain,
Black Diamond,
Mowing Machine,
German Pattern,
Chocolate, Ax Bits,

Stones made, labeled and branded in any style desired. PRICE and QUALITY GUARANTEED. All the above brands are of clear, keen grit and *will not glaze.*

CORN SHELLER!



THE BEST HAND SHELLER MADE.

Will Shell 1 Bushel of Corn in 4 Minutes.

PRICE, - - - - - $3.00

SOLD BY DEALERS EVERYWHERE.

Write for Particulars and Discount to the Trade.

LEHIGH VALLEY EMERY WHEEL COMPANY,
LEHIGHTON, PA.

HEMACITE

ADDRESS
DIBBLE MFG. COMPANY,
TRENTON, N. J.

REGISTERED HEMACITE { DOOR KNOBS, DRAWER KNOBS, SHUTTER KNOBS, HOUSE TRIMMINGS.

ENTERPRISE MANUFACTURING CO.

ALKER & CROMLISH,

Iron and Steel Forgings.

Light Machinery Forgings a Specialty.

Estimates furnished, and all work executed promptly at the most reasonable rates.

Nos. 215 & 217 Main Street,
ALLEGHENY, PA.

THE GLOBE MFG. CO., Middletown, Conn., U. S. A.

CHISELS AND PLANE IRONS.

A full line of Socket Framing and Socket Firmer Chisels, Socket Firmer Gouges, Cold Chisels, Box Chisels, Drawing Knives, "Baldwin" Plane Irons, Harness Snaps, Washer Cutters, Butchers' Choppers and Cleavers, Pocket Wrenches, &c.

Illustrated Catalogue and Discounts to the Trade.

CARRIAGE, CANTON SPRING CO. CANTON OHIO. WAGON, AND SEAT SPRINGS.

MARTIN REYNOLDS,

354 Lorimer St., Brooklyn, E. D.,

Brass Smelter & Refiner.

Ingot Brass for Car Bearings a specialty.

Brass washings for bell makers always on hand.

PHILADELPHIA.

Corrected Weekly by Lloyd, Supplee & Walton.)

Terms, 30 days. For 60 or 90 days, interest added at 10% per cent. per annum.

Anvils.
Peter Wrights, ₩ ℔ ..... 11 @ 11½c
Over 200 lbs. 11c
Trenton 10¾c

Apple Parers.
Globe Apple Pearers ..... $6.00 net
Penn Apple Parers ..... $6.00 net
Lots of 10 to 25 dozen special prices.
Bay State Peach Parer $9.00

Axes.
Hunt's Kentucky and Yankee, per doz. $10.00 @ 10.50
Robert Mann. ..... $8.00 @ $8.25
Richland Chief ..... " $8.50 @ 8.75
Beveled Axes ..... add 50c " net
Double Bit Axes ..... net " $10.00 @ 20.00

Augers and Auger Bits.—New List January 7, 1880.
Bates' Nut Augers ..... dis 40&10 %
Cook's Augers ..... dis 40&10 %
Watrous' Ship Augers ..... dis 15 %
Benjamin Pierce Auger Bits ..... dis 40 %
Griswold Auger Bits ..... " dis 40&10 %
Cook's " ..... dis 40&10 %
Jennings' " ..... dis 10, 10&10 %
Bonney's Pat. Hol. Augers, list $48 ₩ doz. dis 25&10 %
Stearns' Pat. Hol. Augers, list $48 ₩ doz. dis 25&10
Balances.
Light and Common ..... dis 15&10 %

Bells.
Bevin Bros. Mfg. Co. Light Hand Bells ..... dis 60&10 %
Swiss Pattern Hand Bells ..... low list dis 40&10 %
Connell's Door Bells ..... dis 10 %
Gt. Western & Kentucky Cow new list ..... dis 50 %

Boring Machines.
Upright, without Augers ..... List 5.50 } dis 45 %
Angular, without Augers ..... " 6.75 }

Bolts.—Eastern Carriage Bolts ..... dis 80 %
Philadelphia " ..... new list dis 70&10 %
Stanley, Wrought Shutter ..... dis 50&10 %

Braces.—Barber's ..... dis 40&5 %
Backus ..... dis 60 %
Spofford ..... dis 50&5 %
American Ball ..... dis 55 %

Butts.—Cast Fast Joint, Narrow ..... dis 45&10 %
" " Broad ..... dis 45&10 %
Cast Loose Joint, Narrow ..... dis 55&10 %
" " Broad ..... dis 55&10 %
" Acorn, Loose Pin ..... dis 40&10 %
" " " Jap'd ..... dis 60&10 %
" Mayer's Loose Joint ..... dis 60&10 %
Wrought Loose Pin ..... dis 5&10 %
" Table Hinges and Back Flaps ..... dis 40&10 %
" Narrow Fast ..... dis 40&10 %
" Loose Joint ..... dis 45&10 %

Blind Butts.
Parker ..... dis
Clark ..... dis
Shepard ..... dis
Lull & Porter ..... dis 70&10 %
Huffer's ..... dis 50 %

Chains.—German Halter and Coil, list December 31, 1881 ..... dis 40&5 %
Galvanized Pump ..... ₩ ℔ 9½c net
Best Proof Coil Chain—English.

₩ ℔	13	10	8½	7½	7¼	7	gold
	9-16	¾	5-16	⅜	7-16	½	in.

Chisels.—Socket Framing ..... dis 60&10 %
Socket Firmer ..... dis 60&10 %
Butcher's ..... $5.00 to £ gold

Casters.—Bed (new list July 1, 1880) ..... dis 25&10 %
Plate ..... dis 35&10 %

Coffee Mills.—Box and Side, new list Jan. 1, 1880 ..... dis 50 %
Enterprise ..... dis 25 %

Cutlery.—Walden Pocket ..... new list net
Penna. Knife Co ..... new list net
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.

Drawing Knives.
Hart Mfg. Co.'s ..... dis 60&10 %
Adjustable Handle ..... dis 20 %

Fry Pans.
Tinned ..... dis 45 %

₩ doz.	$5.00	4.00	4.50	5.00	5.50	6.50	7.50	9.00	10.00
No.	0	1	2	3	4	5	6		

Burnished ..... dis 60 %

₩ doz.	3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00
Fo.	0	1	2	3	4	5	6	7	8

Files.
Nicholson ..... dis 40 %
Disston ..... dis 40 %
Butcher ..... $4.50 ₩

Fluting Machines.
Eagle—3½ in. roll ..... each, $2.10 } dis 25 %
" —4½ in. roll ..... " 2.85 }
Crown—4½ in. roll ..... " 3.50 } dis 25 %
" —6 in. roll ..... " 4.00 }
" —8 in. roll ..... " 6.50 }
Geneva Fluter ..... dis 25 %
Favorite com Fluter & Sad Iron ..... ₩ doz $10.50 net

Hammers.
Yerkes & Plumb's, new list ..... dis 30 %
Maydole Hammers ..... dis 15 %
Howell A. E. Nail Hammers, ... per doz. net $3.75

Handles.
Disston Loop Handles Crosscut ..... 33c pair net
Boynton Loop Handles Crosscut ..... 33c pair net

Hatchets.
Yerkes & Plumb, new list ..... dis 30 %
Hunt ..... dis 25 %

Hinges.
Strap and T ..... dis 0&10&10 %

Horse Nails.

Nos.	5	6	7	8	9	10
Ausable	30	27	25	24	23	22
" Pol'd & P't'd and Blued and Pointed	31	28	2	25	24	23
Globe ..... New list	31	28	26	25	24	23
Clinton	23	21		20	19	18
" Polished & Pointed	24	22	21		20	19

Blacksmith Favorite, all sizes ..... 12c lb
Discount on Ausable, 20&10&2½; Clinton, 20&10&2½; Globe, 20%

Hay and Straw Knives.
Lightning ..... per doz, net $18.00
Electric ..... " " 15.00
Wadsworth ..... " " 10 50
Walton Straw Knives ..... " " 17 00

Locks and Knobs.
Branford ..... new list dis 45&2 %
Gaylord Cabinet ..... dis 25&2 % cash
American Padlocks ..... dis 35 &2 % cash
Scandinavian Padlocks ..... dis 50 %

₩ doz.	$5.00	5.50	6.50	7.50	8.50	10.00	12.50	} dis 60 %
No.	57	58	59	60	61	62	63	
₩ doz.			$18.00		26.00		33.00	} dis 60 %
No.			64		65		66	

Lanterns.
Buckeye ..... Large list net; small list net
Tubular ..... No. 0, $8.65; No. 1, $10.15 ₩ doz net
Guards, 35 cents extra per doz. net.

Lawn Mowers.—Pennsylvania ..... } new list
Philadelphia ..... } dis 30 %
Excelsior ..... }

Lawn and Garden Pumps.
Holland Patent ..... List $5.00 dis 10 %

Mattocks.
Long and Short Cutter ..... new list ..30
Pennsylvania Pattern ..... dis 30

Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets ..... dis 25 %
Stebbins' Gates ..... dis 70&10%
Lincoln's " ..... dis 60&10 %
Landers, Frary & Clark's Petroleum ..... dis 20&10 %
Brass Liquor Cocks, new list Jan. 1 1882 ..... dis 40 %
Cork Lined " ..... dis 70 %

Meat Cutters.
Dixon's ..... dis 25&5 %
Woodruff ..... dis 25&5 %
Stowe ..... dis 25&5 %
Hale's ..... new list, dis 50, 10&2 cash
American ..... dis 25 %
Stuffers ..... dis 25&5 %
Enterprise Stuffers ..... dis 25 %

Planes.—Sandusky Tool Co ..... dis 20 %
Ogontz ..... dis 25 %
Ohio & Auburn ..... dis 20 %
Bailey (S. R. & L. Co.) ..... dis 20&10 %

Plane Irons.—Ohio Tool Co ..... dis. 20 %
Butcher's ..... £. $4.00

Plumbs and Levels.
Stanley's Adjustable ..... dis 65&10 %
" Non-Adjustable ..... dis 65&10 %

Picks.—New list ..... 30 %

Razor Strops.
Lamont Combination ..... per doz. $4.00
" ..... 1 gross lots $42.00
Imitation Emerson ..... per doz. 2.00

Rules.—Stanley Boxwood ..... dis 66⅔ &10 %
Stanley Ivory ..... dis 55&10 %

Steelyards.—Hart's Pattern ..... dis 30&10 %

₩ doz.	$14.50	17.75	21 00	26.50	31 00	35.50
Lbs	50	100	150	200	250	300

American Pattern ..... dis 30&10 %

₩ doz.	$8.00	10.25	13.75	15.50	16.75	19.50
Lbs.	50	100	150	200	250	300

Squares.
Steel and Iron ..... dis 50 %; full case, dis 60&10 %
Try Squares, Stanley ..... dis 60&10 %
Disston's Try Squares ..... dis 40 %

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened ..... ₩ doz $9.00
Clipper, No. 10, Bronzed Blade, Boxed and Sharpened ..... ₩ doz $8.50 } 10 & 10
Clipper No. 5, Painted Red, Boxed and Sharpened ..... ₩ doz $8.00

Saws.—Disston's Hand, Panel and Rip ..... dis 20 %
Disston's Circular ..... " dis 40 %
" Cross-Cut No. 2, Plain Tooth ..... dis 40%
" Patent Tooth ..... dis 40%
" Champion Tooth ..... dis 40%
Boynton's Lightning Cross Cut, new list ..... dis 40 %
" Lightning Buck Saws, cross bar ..... dis 40 %

Shovels and Spades.
Oliver Ames & Sons, new list ..... dis 15 %
Griffiths ..... dis 50&10&5%
Rowland ..... dis 50&10&5%

Sad Irons.—4 to 10 lbs ..... ₩ ℔ 3½c
Mrs. Potts' Patent ..... dis 35 %

Stone.
Washita Extra ..... ₩ ℔ 28c net
" No. 1 ..... " 20c
" No. 2 ..... " 16c
" halves ..... " 45c
" AXE ..... " 130 net
Hindostan Oil Stone No. 1 ..... ₩ ℔ 50 } dis 33⅓
" Axe Stone ..... " 80 }
" Slips ..... " 100 }

Screws.
Flat Head Iron ..... dis 30 %
" Brass ..... dis 30 %
Round Head Brass ..... dis 30 %
" Iron ..... dis 25 %

Spoons.
Plated ..... dis 40&5 %
German Silver ..... dis 30 & 10 %
Britannia, Boardman's ..... dis 60 %
" Parker's ..... dis 60 %
Tinned ..... dis 10 %

Springs.—Torrey ..... dis 40&10 %
Gem No. 3 small Jap'd ..... $2.00 } dis 40 %
" No. 2 medium Jap'd ..... 2.75 }
Coil No. 0, per gross net $10.00
Warner Door Springs, per doz. net 1.75
Standard Spring Hinges—
Single No. 0, per doz. net 1.50
" No. 1, " " 1.60

Stocks and Dies. ..... dis 10&5 %

Stove Polish.—Gem ..... ₩ gross, $1.50, dis 5 %
Dixon ..... " 6.00, dis 10%
Fire Fly ..... $3.00 gross net

Tacks. ..... dis 30 %
Shoe Nails—4-8, and over 8c ..... } Net
" " 3½-8, and under 9c ..... }
Double Pointed Tacks ..... dis 40&5 %

Traps.
Genuine Oneida—Newhouse ..... dis 35 %
Im. Oneida—Newhouse list, first qual. dis 55&5 @ 60 %

Vises.—Solid Box, Trenton new list ..... dis 35 %

Wrenches.—Agricultural ..... dis 60&10 %
Coes' Genuine ..... dis 40&10 %
" " Mechanics' ..... dis 40&10&10 %
" " Mall. Bar ..... dis 75 %

Wire.
Bright or Ann'd, No. 0 to 18 ..... dis 50 to 52½ %
" No 19 to 26 ..... dis 57½ to 60 %
" No. 27 to 36 ..... dis 62½ to 65 %
Coppered, 0 to 18 ..... dis 45 to ½ %
Tinned Broom Wire ..... dis 52½ to 55 %
Galvanized Barb Wire 9¼c
Painted Barb Wire 8¼
Galvanized No. 7 to 18 ..... Market List, dis 42½ to 45 %

Wringers.
Peerless No. 2½ $45.00
" " 2 ..... 48.00
Universal, No. 2½ 45.00
Novelty, No. 10 ..... 45.00

PITTSBURGH.

Merchant Iron.

TERMS.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 per cent. for cash, if remitted within 10 days from date of invoice.

For fluctuations and discounts on card rates see weekly Pittsburgh Trade Report.

The following are card rates.

Flat Bar.

1½ to 4 by ⅛ to 1 inch 2.50
4¼ to 6 by ⅛ to 1 " 2.60
1⅜ to 6 by 1⅛ to 1¾ " 2.90
1¼ and 1⅜ by ⅜ to 2¼ " 2.60
1 and 1¼ by ⅜ to ¾ " 2.70
⅝, ¾ and ⅞ by ⅜ to ⅝ inch 2.90

Rounds and Squares.

1 to 1⅞ ..... 2.50 | ⅝ to 9-16 ..... 2.70
2 to 2⅝ ..... 2.70 | ½ to 7-16 ..... 2.90
2¾ to 3¼ ..... 3.00 | ⅜ 3.10
3⅜ to 4 ..... 3.50 | 5-16 ..... 3.30
4¼ to 5 ..... 4.00 | ¼ 3.50
⅝ to ⅞ ..... 2.60 | 3-16 ..... 5.50

Oval Iron.

⅞ to 1⅜ ..... 2.90 | ⅛ 3.30
⅝ to ¾ ..... 3.10 | ⅜ 3.70

Half Oval and Half Round.

⅞ to 1¼ inch ..... 3.20 | ⅛ inch 4.00
⅝ to ¾ " ..... 3.70 | ⅜ " 5.50

Horse Shoe.

⅝ to 1⅛ by 5-16 to ½ inch 3.40

Wagon Box Iron.

⅞ Inch. Nos. 13 and 14 ..... 3.70
⅞ " " 11 and 12 ..... 3.50
¾ " " 13 and 14 ..... 3.40
¾ " " 11 and 12 ..... 4.00
⅝ " " 13 and 14 ..... 3.80
⅝ " " 11 and 12 ..... 4.40

Heavy Bands.

3½ to 5 by ¼ and 5-16 inch 2.70
1¾ to 3½ by ¼ and 5-16 " 2.70
1 to 1¾ by ¼ and 5-16 " 2.80
⅝ to ⅞ by ¼ and 5-16 " 4.00
⅝ and ⅞ by ¼ and 5-16 " 3.50

Light Bands.

1¼ to 6 by ⅛ to 3-16 ..... 3.00
1¼ to 6 by Nos. 11 and 12 ..... 3.10
1 to 1¾ by ⅛ to 3-16 ..... 3.10
1 to 1¾ by Nos. 11 and 12 ..... 3.20
⅞ and 13-16 by ⅛ to 3-16 ..... 3.20
⅞ and 13-16 by Nos. 11 and 12 ..... 3.40
⅝ and 11-16 by ⅛ to 3-16 ..... 3.70
⅝ and 11-16 by Nos. 11 and 12 ..... 3.80
⅝ and 9-16 by ⅛ to 3 16 ..... 3.80
⅝ and 9-16 by Nos. 11and 12 ..... 4.00
⅝ inch by ⅛ and 3-16 ..... 4.10
⅝ inch by Nos. 11 and 12 ..... 4.20

Hoop Iron.

1¼ to 4, Nos. 13, 14 and 15 ..... 3.30
1¼ to 2, Nos. 16, 17 and 18 ..... 3.40
1¼ to 2, No. 19 ..... 3.50
1¼ to 2, No. 20 ..... 3.60
1¼ to 2, No. 21 ..... 3.80
1¼ to 2, No. 22 ..... 3.70
15-16 1, and 1¼, Nos. 13, 14 and 15 ..... 3.80
15-16, 1, and 1¼, Nos. 16, 17 and 18 ..... 3.60
15-16, 1, and 1¼, Nos. 19 and 20 ..... 3.70
15-16, 1, and 1¼, No. 21 ..... 3.80
15-16, 1, and 1¼, No. 22 ..... 3.90
⅞, Nos. 13, 14 and 15 ..... 3.90
⅞, Nos. 16, 17 and 18 ..... 3.70
⅞, Nos. 19 and 20 ..... 3.80
⅞, No. 21 ..... 3.90
⅞, No. 22 ..... 4.00
13-16 Nos. 13, 14 and 15 ..... 4.10
13-16, Nos. 16, 17 and 18 ..... 3.90
13-16, Nos. 19 and 20 ..... 4.10
13-16, No. 21 ..... 4.20
13-16, No. 22 ..... 4.30
¾, Nos. 13, 14 and 15 ..... 4.00
¾, Nos. 16, 17 and 18 ..... 4.10
¾, Nos. 19 and 20 ..... 4.20
¾, No. 21 ..... 4.30
¾, No. 22 ..... 4.40
11-16, Nos. 13, 14 and 15 ..... 4.20
11-16, Nos. 16, 17 and 18 ..... 4.30
11-16, Nos. 19 and 20 ..... 4.40
11-16, No. 21 ..... 4.50
11-16, No. 22 ..... 4.60
⅝, Nos. 13, 14 and 15 ..... 4.40
⅝, Nos. 16, 17 and 18 ..... 4.50
⅝, Nos. 19 and 20 ..... 4.60
⅝, No. 21 ..... 4.70
⅝, No. 22 ..... 4.80
⅝, No. 23 ..... 4.90
9-16, Nos. 13, 14 and 15 ..... 4.90
9-16, Nos. 16, 17 and 18 ..... 4.70
9-16, Nos. 19 and 20 ..... 4.80
9-16, No. 21 ..... 4.90
9 16, No. 22 ..... 5.00
9-16, No. 23 ..... 5.10
⅜ inch, Nos. 13, 14 and 15 ..... 4.80
⅜ " Nos. 16, 17 and 18 ..... 4.90
⅜ " Nos. 19 and 20 ..... 5.10
⅜ " No. 21 ..... 5.20
⅜ " No. 22 ..... 5.30
⅜ " No. 23 ..... 5.40

The prices under Hoop Iron do not apply to Cotton Ties.

1-10c per lb. extra will be charged for each gauge lighter than the lightest indicated.

1-10c per lb. extra will be charged for cutting Hoops to specified lengths.

Barrel Hoops.

1¾ to 2 in., cut to length.

9 to 11 lbs. per set of 6 hoops 3.50
8 lbs. and less than 9 lbs. per set of 6 hoops 3.60
Less than 8 lbs. per set of 6 hoops 3.80

Extras for Cutting to Length all Preceding Iron.

All Iron, including Tire 1.100

Tank Iron.

No. 9 and heavier 3.90
Plow Slabs 3.90
" Wings 3.80

Sheet Iron.

	Common.	Charcoal.	Juniata.
No. 10 to 14	3.40	4.00	6.50
No. 15 to 17	3.80	4.30	6.80
No. 18 to 21	4.10	4.60	7.10
No. 22 to 24	4.30	4.80	7.30
No. 25 & 26	4.50	5.00	7.50
No. 27	4.70	5.20	7.70
No. 28	4.10	4.60	8.10

All sheets No. 18 and lighter, over 30 inches wide, not less than 2.10c extra.

Wood's Patent Planished Sheet.

1st quality (A) ..... 10½c | 2d quality (B) 9½c

Galvanized C. H. B.—(Charcoal Hammered Blooms.)

Nos. 14 to 20	12c	No. 27	15c
Nos. 21 to 24	13c	No. 28	15c
Nos. 25 and 26	14c	No. 29	18c

37½ @ 40 % discount.

Coal Screen Iron.

1¾ by ⅝ by 5-16 ..... 3.00 | 1 by ⅝ by 5-16 ..... 3.50

Angle Iron.

2½, 3, 3½ and inch 3.30
1½, 1¾ 2 and 2¼ inch 3.30
1¾ inch 3.40
1 " 3.50
1¼ by 1 inch, for Plow Handles 3.80
1¼ by ¾ " " " 3.80
1⅜ by ¾ " " " 3.90

T Rail.

8 lbs. to the yard ..... 2.50 | 20 lbs. to the yard 2.80
12 " " ..... 2.80 | 28 " " 2.80
16 " " ..... 2.80 | 30 " " 2.80

Splice Joints for 12, 16 and 20-lb. Rail, 40c each; 28 and 30 lb. Rail, 50c each; 40 lb., 60c each.

3½ by ⅝ and ½ Spikes for 20 and 28-lb. Rail 4½c
2½ and 3 by ⅝ " " 12 and 16-lb. " 4½c
2½ by 5 16 " " 8-lb. Rail 4½c

Flat Rails.—Punched and Countersunk.

1½ to 2 by ¼ to ¾ inch 3.00
1½ by ⅝ and 7-16 inch 3.20
1¼ by ⅝, 7-16 and ½ inch 3.50

Juniata Nail Rods 6.50
Norway " 8.00
Guard Iron, ¼x⅝x1½ and ¼x⅝x1⅝ " 4.00
" ⅜x⅝x1⅝ and ⅜x⅝x1¾ 4.20
Drag Bars 3.30
Dropper Bars 3.40
Cylinder and Landside Iron 3.20
Plow Beam Iron 3.00

Nails.

See Pittsburgh Trade Report.

Best Quality Refined Cast Steel.

Square, Flat, Octagon and Round.

⅛ to 2 inches, inclusive 13c
1-16 and 2⅛ to 3 inches 13c
¼ and 3⅛ to 4 " 14c
7-32 and 4⅛ to 5 " 15c
9-16 and 5⅛ to 6 " 18c
5-32 inch 23c
⅛ inch 30c
Oil Well Steel Forgings 20c

Machinery Steel.

	Crucible.	Bessemer & Open Hearth
Ordinary Sizes, ⅛ to 2 inch Round	7½c	5c
5-16 and 2⅛ to 3 inches	8½c	6c
¼ and 3⅛ to 6 "	9½c	7c
7-32 inch	10½c	8c
4-16 "	12½c	10c

Square, Flat and Octagon, ½c extra throughout the list.

Cut to specified lengths, ½c extra.

Hammer Cast Steel.

Crucible Cast Steel 8½c
Open Hearth Cast Steel 7c

Sheet Steel.—Crucible.

	Best.	2d Qual.	3d Qual.	Bessemer & Open Hearth
To 21 gauge	12½c	11c	9c	7c

1c. extra for each additional gauge.

Cut to multiples or specified lengths, ½c. extra.

Miscellaneous Cast Steel.

Auger and Auger Bit 8½c
Axle Steel for carriages and wagons 8½
Frog Points and Plates 10c
" Side Bars 8½c
Pick, plain (hammered) 10c
" and Mattock, beveled (rolled) 8½c
Skate Steel 9c
Table Cutlery, plain 7½c
Table Cutlery, beveled 8½c
Pike and Cant Hook 8½c
Coal and Granite Wedge 8½c
Roller 8½c
Spindle, subject to Machinery classification 8½c
Trap Spring Steel 10c
Forged Crank Pins and Lathe Spindles 11c
Piston Rods, plain 8½c
" forged to shapes 11c
Slide Bars, plain 8½c
" forged to shapes 11c

Crucible, Open Hearth or Bessemer.

Boiler, Fire-Box and Flue Sheets, not less than 3-16 thick 9½c
Boiler, Fire-Box and Flue Sheets, not less than ⅛ thick 7c
Circulars and semi-circulars, when ordered separately 8c
Smoke Stack, to shape 8c
Locomotive Tank Steel 7c

File Cast Steel.

Square, Round, Half Round and Flat Bastard, 8-inch and over 8c
Mill Saw, 8-inch and over 8½c
Taper, 3½-inch and over 8½c
Horse and Shoe Rasp 9½c

Spring Cast Steel.

Spiral and Taper, cut to lengths 6½c

Tire Cast Steel.

1x¼ and over 7c
1x3-16, ⅞x3-16 and ¼ 8½c
1 and 12-16x⅛ and 5-32, ⅞x3-16 and 5-32 ..... 9c
⅝ and ⅝x⅛ and 3-32 and 12 g 9½c
Solid Safe Cast Steel 10c
Three and Five Ply Cast Steel 7½c

Agricultural Implement Cast Steel.

Fork and Rake, Crucible 8c
Horse Rake Steel, cut to lengths, Crucible 8½c
Hoe, Crucible 7½c
Corn Stalk Cutter, beveled 7½c
Beveled Hoe and Shovel Steel in Bars 8½c
Crucible Plow Steel in slabs 7½c

Bessemer and Open Hearth.

Spring 4½c
" spiral and taper, cut to lengths 4½c
Tire, 1-16 thick and above 3½c
Toe Calk 4½c
Plow 4½c
Axle Billets 4½c
Sleigh Shoe 4c
Cutter Shoe, cut to lengths and tapered 4c
Scythe Back Steel 5½c
Grain Drill Bars 4c
" Points 4½c
Rolling Coulter Blanks, cut and punched 8½c
Thrasher Steel 6½c
" Teeth 4½c
Rolled Hammer Billets 4½c

Terms.—Four months: 2 per cent. discount for cash, if remitted within 30 days.

Rolls and Castings.

Furnace Floor and Straightening Plates 2½c
Housings and Castings not otherwise specified ..... 3 c
Guide Plates ..... 3 c
Spindles and coupling boxes 3½c
Sand Rolls and Pinions, large size 3½c
" " small size 3½c
Pipe Mill Castings 3½c
Rolling Mill Castings under 50 lbs 5
Spur and Bevel Wheels, large ..... 4 c
" " small ..... 4 c
Pulleys up to 30 inches 4½c
" over 30 inches 4½c
Engine Castings, light ..... 4 c
" " heavy 4½c

Chilled Rolls.

6 to 7 in. diam. 7 to 20 in. long 6c
8 to 14 in. " 8 to 40 in. " 6c
16 to 24 in. " 15 to 72 in. " 5c
14 to 21 in. " 72 to 108 in. " 4½c

After Oct. 1, 1881, no discounts will be made at settlement as heretofore, prices quoted being net.

White and Red Lead.

Strictly Pure White Lead in Oil, in kegs, 6¾c.; in 25 ℔ Pails, 10c ₩ ℔ over keg price; 12½ ℔ Tin 25c. per ₩ ℔ over keg price.

Dry White Lead in barrels 6½c
Red Lead, very brilliant, in kegs, 7c; in barrels 6½c
Litharge (Potter's Lead) " 7c;
Freights equalized with all points where White Lead is made.

Terms: Note at sixty days, or if paid within 15 days from date of invoice a discount of 2½ per cent. will be allowed, but not otherwise.

Window Glass.

Discount, 65 % on Single Strength, 70 % on Double.

Single Strength.

Size.	AA.	A.	B.	C.
5 x 8 to 10 x 15	$8.25	$7.50	$7.00	$6.50
11 x 14 to 16 x 24	9.25	8.50	8.00	7.25
18x 22 to 20 x 30	10.75	9.75	8.75	7.75
14 x 36 to 24 x 30	12.25	10.75	9.00	8.50
26 x 28 to 24 x 36	13.00	11.50	9.75	9.00
26 x 36 to 36 x 44	14.50	13.25	10.75	9.50
26 x 40 to 30 x 50	15.00	14.00	11.25	10.50
30 x 52 to 30 x 54	16.00	14 50	12.00	
30 x 56 to 34 x 56	17.25	15.50	13.50	
34 x 58 to 34 x 60	18.25	17.25	15.00	
36 x 60 to 40 x 60	20.75	18.75	17.25	

Double Strength.

6 x 8 to 10 x 15	12.75	11.75	10.75	10.00
11 x 14 to 16 x 24	14.50	13.25	12.50	11.25
18 x 22 to 20 x 30	17.25	15.75	14.00	
14 x 36 to 24 x 30	19.75	17.25	14.50	
26 x 28 to 24 x 36	21.00	18.50	15.75	
26 x 36 to 30 x 44	23.25	21.25	17.25	
26 x 46 to 30 x 50	24.00	22.50	18.00	
30 x 52 to 30 x 54	25.75	23.25	19.25	
30 x 56 to 34 x 56	27.75	25.00	21.75	
34 x 58 to 34 x 60	29.25	27.75	24.00	
36 x 60 to 40 x 60	33.25	30.00	27.75	

An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 52 inches in length and not making more than 81 united inches, will be charged in the 84 united inches bracket.

BOSTON.

Reported by Macomber, Bigelow & Dowse.

Anvils.—"Eagle American" ₱ lb 9½c dis 20 %

Anvil & Vise.—
No. 1, $4.25; 2, 4.25; 3, 3.50 each.....dis 25 %

Augurs & Bitts.—Snell's Auger.....dis 40&10 %
L'Hommedieu's Ship Auger.....dis 15 %
Jenning's Bitts.....dis 10&10&10 %
Cook's Bitts.....dis 40&10 %
Shepardson's Double-Cut Bitts.....dis 45 %
Shepardson's Double Gimlets.....dis 40 %
Stearn's Extension Hollow Augers—
No. 2, ₱ doz., $48.00: No. 3, ₱ doz., $60.00 list. dis 20 %
Bonney's Extension Hollow Augers.....₱ doz $36.00
Pierce's Bitts.....dis 40 %
Griswold Bitts.....dis 40&10 %

Axes.—Blue Jackets.....₱ doz $9.00
Red Cross.....₱ doz 8.00
Red Cross Handled.....₱ doz 12.00
Dowse Handled Boys'.....dis 33⅓ %

Ax Handles.—
Oak Extra, 31 in., No. A.....₱ doz $2.50
Oak Extra, 34 in., No. A.....₱ doz 2.50
Oak Extra, 31 in., No. B.....₱ doz 2.00
Oak Extra, 34 in., No. B.....₱ doz 2.00
Oak Extra, 31 or 34 in., No. C.....₱ doz 1.50

Axle Clips.....dis 50 %
Balances.—Chatillon's.....dis 15&10 %

Barn Door Rail.—
Cast Angle (for Anti-Friction Hangers).....₱ ft. 20
Cast Half Round.....₱ ft., ⅝, 30; ¾, 40
Wrought Round.....₱ ft., ¾, 30; ⅞, 40; 1, 50

Bells.—Connel's Crank Gong, reduced list..dis 10&10 %

Bird Cages.—
Japanned M. B. & D., reduced list, 1879.....dis 40 %
Brass M. B. & D., reduced list 1879.....dis 33⅓ %

Blind Fasts.—Lock Fasts.....₱ C sets $6.00
No. 6 Fasts.....₱ C sets 6.00
Veazie Fasts.....₱ C sets 6.00
Shedd's.....₱ C sets 7.00
Blind Hinges.—Mall, Hook, 3 holes.....₱ C sets 7.00

Brad Awl Handles.—
Phœnix Adjustable.....₱ doz $2.00

Bolts.—Norway Iron Carriage.....dis 70&10 %
Common Iron Carriage.....dis 60&5 %

Borax.—Refined.....₱ lb 13½c

Boring Machines.—
Eagle Upright each.....$5.50 list } dis 40&10 %
Eagle Angle each.....6.75 list }
Snell Augers.....₱ set $2.45

Braces.—Barber's.....dis 40&5 %
Spofford's.....dis 10&5 %
Backus'.....dis 50&10 %

Bracket Saws.—Holly Scroll Saw.....each $2.25
Demas Lathe and Scroll Saw.....each 6.50
Bracket Saws, extra quality, to No. 5.....₱ gro 0.75
Steel Frame, with patterns.....₱ doz 6.50
Lester.....dis 20 %
New Rogers, all iron.....dis 25 %

Bracket Saw Blades.—Griffith's pat.....₱ gross 750

Brackets.—
H. B. & M. Flower Pot, reduced list.....dis 30&10 %
Bronzed Shelf, M. B. & D., new list.....dis 50 %
Store Shelf.....dis 40 %

Butts.—Union Fast Joint.....45&12½ %
Union Loose Joint.....dis 55&12½ %
Union Japanned Acorn.....dis 55&10 %
Union Silvered Acorn.....dis 55&12½ %
Union Boston Finish.....dis 70&10 %
Union Spiral Spring.....dis 25&10 %
Wrought Brass.....dis 65& 10%

Carriage Bolts.—Eagle Norway.....dis 70&10 %
Common.....dis 80 & 5 %

Carriage Jacks.—Climax No. 1.....₱ doz $32.00
Climax No. 1½.....₱ doz 15.00
Climax No 2.....₱ doz 13.50
Universal.....dis 25 %
Universal No. 1.....each, $2.00
Universal No. 2.....each 3.00
Universal No. 3.....each 4.00
Universal No. 4.....each 6.00
Universal No. 4.....each 6.50

Cartridges.—U. S. Cartridge Co.....dis 70 %

Cards.—
Watson's make Horse & Curry....dis 10 % } New List,
Watson's Cotton.....dis 10 % } July, 1881.
Watson's Wool.....dis 10 % }

Casters.—Bed and Table.....dis 45 %

Chain.—Traces 6½, 10, 4, straight.....₱ pair 40c
Traces 6½, 10, 4, twisted.....₱ pair 55c
Traces 7, 12, 2, twisted.....₱ pair 80c
Coil 3-16.....₱ lb 11c
Coil ¼.....₱ lb 9½c
Coil 5-16.....₱ lb 8c
Coil ⅜.....₱ lb 6½c
Coil 7-16.....₱ lb 6½c
Coil ½.....₱ lb 6c

Chalk.—White, Carpenter's.....₱ gross 60c
Red, Carpenter's.....₱ gross 80c
Blue, Carpenter's.....₱ gross $1.00

Chisels.—Hart, Bliven & Mead, Framing..dis 60&10&10%
Underhill, Framing.....dis 25 %
Buck's Chisels.....dis 30 %

Clothes Line.—
Galvanized Wire, 100 feet each.....₱ doz $1.00

Coal Hods.—"Dover."—Galvanized, New List.dis 50%
Japanned, new list.....dis 50 %

Coffee Mills.—New List.....dis 33⅓&10 %

Copper Rivets.....dis 33⅓ %

Cow Ties......dis 33⅓ %
No. 30, 3 ft. No. 6 Wire, with toggle.....₱ doz $3.50
No. 35, 3 ft. No. 6 Wire, with snap.....₱ doz 4.00
No. 40, 3½ feet No. 6 Wire, with toggle.....₱ doz 4.50
No. 45, 3½ ft. No. 6 Wire, with snap.....₱ doz 4.50
No. 50, 4 ft. No. 4 Wire, with toggle.....₱ doz 4.75
No. 55, 4 ft. No. 4 Wire, with snap.....₱ doz 5.00
No. 60, 4½ ft. No. 3 Wire, with toggle.....₱ doz 5.00
No. 65, 4½ ft. No. 3 Wire, with snap.....₱ doz 5.50

Cocks.—Brass, L. F. & Co.....dis 40 %

Cordage.—Manila, usual trade dis 1c.....₱ lb 16½c
Jute.....₱ lb 9c

Crow-Bars.—Cast Steel.....₱ lb 7½c
Iron, Steel-pointed.....₱ lb 6c

Cutlery.—Pocket American Shear Co.'s.....dis 40 %
Butcher Knives, Wood's, Lap Bolster, Square Handle.....dis 30 %
Steak Knives.....dis 25 %
Lap Bolster, Oval Handle.....dis 20 %
Sticking.....dis 20 %
Skinning.....dis 30 %
Butcher, Common Round Handle, Wood's.....dis 20 %
Shoe Knives, Wood's.....dis 20%

Dividers.—Cook's.....dis 25 %
Dog Collars......dis 20 %
Dog Muzzles.—Automatic.....dis 15 %
Door Springs.—Torrey's Rod.....₱ doz $1.62
Imitation Torrey's Rod.....₱ doz 1.45
Gem Coil, new list.....dis 40 %
Crown.....₱ doz 1.25
Warner's.....₱ doz 2.00

Door Stops.—Thurston's.....dis 50 %
Drawer Knobs.—Thurston's.....dis 50 %
Drills.—Morse Bitt Stock.....dis 25 %
Morse Straight Shank.....dis 20 %
Emery.—Wellington Mills.....₱ lb 1 c
Walpole Emery Mills.....₱ lb 6c
Turkish in 10 lb cans.....₱ lb 8c
Enameled Ware.—
Standard Mfg. Co. Kettles.....dis 40 & 10 %
Standard Sauce Pans.....dis 25 %
Felloe Plates.—Wrought.....₱ lb
Files.—American File Co.....dis 40 %
Nicholson File Co.....dis 40 %
Fluting Machines.—Knox list, $4.00.....dis 20 %
American list, $3.40.....dis 20 %
Forks.—W. C. & Co. Manure.....dis 50 %
Gimlet Bits.—
Genuine German, No. 135, 1-32 to 8-32, per doz $1.00
Pierce's.....per doz .88
Glass Cutters.—Combination Glass Cutter and Knife Sharpener.....₱ doz $1.00
Grub Hoes.—K. P. & Co.'s No. 2, $11.50 ₱ doz.dis 40 %
Hammers.—Maydole's.....dis 15 %
Eartford Hammer Co.....dis 20 %
Hangers & Rollers.—Anti-Friction.....dis 50 %
Acme Rollers.....dis 50 %
Climax.....dis 50 %
Common Hangers.....dis 50 %
Common Rollers.....dis 50 %
Hand Screws......dis 10 %
Hatchets.—C. F. Dowse new list.....dis 33⅓ %
Underhill.....dis 25 %
Hay Knives.—Lightning.....₱ doz, $18.00, net
Fisher's Patent.....₱ doz $14.00
Hinges.—Strap and T (new list).....dis 40&10 %
Providence Plate.....₱ lb 5¼ %
Wrought Screw Hook.....₱ lb 5¼ %
Hoes.—W. C. & Co.'s.....dis 50 %
Hooks and Staples.—Brewers' (new list)....dis 60 %
Horse Nails..... No. 6 7 8 9
National Finished.... .23 .21 .20 .19....dis 20 %
Putnam Pointed..... .28 .26 .25 .24.....20 %
Horse Nails.—Bridgewater.....dis 25 %
No. 6, 23; No. 7, 21; No. 8, 20; No. 9, 19.
Ice Cream Freezers.—Packer's, new list,....dis 50 %
Knobs.—"Norwalk." New list.....dis 45 %
Silver Glass.....dis 50&10 %
Silver Glass Bell Pulls.....dis 50&10 %
Lanterns.—Guarded, No. 99.....₱ doz $7.50
Tubulars, No. 0.....₱ doz 8.00
Railroad, Oil, No. 43.....₱ doz 9.00
Triangular.....₱ doz 4.00
Hurricane.....dis 20 %
Lawn Mowers.—The "Daisy."
12 in. cut.....each, $8.00
14 in. cut.....each 8.50
16 in. cut.....each. 9.00
18 in. cut.....each, 9.50
Lead.—Sheet.....₱ lb 8 c
Pipe.....₱ lb 7½c
Locks.—Norwalk.....dis 40 %
Eagle Cabinet.....dis 25 %
Eagle Trunk.....dis 15 %
W. Wilcox & Co., Padlocks.....dis 35 %
Manure Forks.—W. C. & Co.....dis 5
Mattocks.—
K. P. & Co., Long Cutter, $16.00 ₱ doz.....dis 40 %
K. P. & Co., Short Cutter, $15.50 ₱ doz.....dis 40 %
K. P. & Co., Pick Cutter, $16.00 ₱ doz.....dis 40 %
Measuring Tapes.—Eddy's.....dis 20 %
Meat Cutters.—Miles' Challenge.....dis 50 %
Hale's, (new list).....dis 40 & 10 %
American.....dis 25 %
Money Drawers.—Tuckerlar's Am.....₱ doz $22.50
Mouse Traps.—Delusion.....₱ doz 2.00
Novelty.....₱ doz
Nails.....₱ keg 3.65
Oilers.—Zinc and Tin.....dis 50 %
Brass and Copper.....dis 40 %
Ox Bows.—Extra finished and varnished.....dis 10 %
1¼ in., ₱ doz. pair..$7.00 | 2 in., ₱ doz. pair, $10.00
1⅜ in., ₱ doz. pair.. 9.00 | 2½ in., ₱ doz. pair . 12.00
Paper.—Tarred Sheathing.....₱ lb 2½c
Tarred Eagle Brand.....₱ lb 2½c
Picks.—K. P. & Co., Adze Eye, 5 to 6 lb $12.00....dis 40 %
K. P. & Co., Adze Eye, 6 to 7 lb $13.00.....dis 40 %
Planes.—
Fancy Planes.....dis 15 %
Razee Planes.....dis 20 %
N. Y. Tool Co.....dis 25 %
English Iron.....dis 20 %
Bailey's.....dis 20&10
Plated Ware.—Rogers & Bro.....dis 40&5 %
Pliers.—Vom Cleff & Co.'s.....net list
Button's Wire Pliers.....dis 33⅓ %
Plumb & Levels.—Stanley R. & L. Co....dis 65&10 %
Pocket Knives.—American Shear Co.'s.....dis 40 %
Potato Diggers.—W. C. & Co., reduced list..dis 50 %
Pulleys.—Acme or Excelsior, 1¾ in.....₱ doz 24c
Acme or Excelsior, 2 in.....₱ doz 27c
Pulley Blocks.....dis 35 %
Pumps.—Union Manufacturing Co.
Iron Cistern.....dis 45 %
Iron Pitcher Spout.....dis 45 %
Copper.....dis 30 %
Rivets.—Black (new list).....dis 45 %
Carriage in 10 lb papers (new list).....dis 45 %
Copper.....dis 33⅓ %
Razors.—Torrey's.....dis 20 %
Razor Straps.—Torrey's.....Full line
Rules.—Stanley, Boxwood.....dis 66⅔&10 %
Stanley, Ivory.....dis 55&10 %
Sad Irons.—Common.....₱ lb 5½c
Laundry.....₱ lb 6½c
Tailors' Geese.....₱ lb 6 c
Enterprise, "Potts'".....dis 35 %
Sash Locks.—King & Hutchinson's, new list.dis 40 %
Sandpaper.—Baeder & Adamson.....dis 20 %
M. B. & D.....dis 25&5 %
Sash Weights.—Patent Eye.....₱ lb 1½c
Saws.—Hand Saws, Disston's.....dis 20 %
Wheeler & Clemson.....dis 20 %
Cross-Cut Saws.
W. M. & Co., Common Tooth, No. 1.....₱ foot 35c
W. M. & Co., Champion Tooth.....₱ foot 35c
Disston's, Common Tooth.....₱ foot 68c dis 40 %
Disston's Great American Tooth...₱ foot 68c dis 40 %
Boynton's Light ing Tooth.....₱ foot 45c
M. B. & D., Hand Saws.....dis 33⅓ %
W. M. & Co.'s Circular Saws.....dis 35 %
Richardson Bros.....dis 25 %
Saw Blades.—Disston.....dis 20 %
W. M. & C.....dis 10 %
Welch & Griffith, Extra.....₱ doz $8.40
Welch & Griffith, No. 2.....₱ doz 7.00
Scales.—Fairbanks.....dis 20 %
Screws.—Aiken's Flat-Head Iron....new list, dis 30 %
American Flat-Head Iron.....new list, dis 30 %
American Flat-Head Brass.....new list, dis 30 %
American Round-Head Brass.....new list, dis 20 %
American Round-Head Iron.....new list, dis 25 %
Grilley Round Head Nickel-Plated, Common..dis 50 %
Scythes.—Clippers, in boxes.....₱ doz $9.00
Shaves.—Kimball's.....₱ inch 7½c
Watrous.....dis 15 %
Shears.—American shear Co., new list.....dis 70 %
Shot.—Tatham's.....₱ lb 7c
Shovels.—O. Ames, new list.....dis 15 %
O. Ames, other brands, new list.....dis 15 %
M. B. & D.....dis 15 %
Oxford, Birmingham Pattern.....dis 40 %
Sinks.—Hagee Patent.....dis 30 %
Snow Shovels.—Malleable Tips.....$3.00
Skates.—Union.....dis 25 %
Acme.....dis 25 %
Imperial Club list No. 5, $3.75 ₱ pair; list No. 7, $5.00 ₱ pair.....dis 20%
Stocks and Dies.—King's.....dis 10&5 %
Tacks.
Swedes Tinned.....dis 30&10 %
Swedes Iron.....dis 30 & 10 %
Gimp and Lace.....dis { 20 & 10%
Copper Tacks.....dis {
All balances on list.....dis 20&10 %
Traps.—Oneida, Genuine.....dis 33⅓ %
Oneida, Imitation, H. & N.....dis 50 %
Blake's.....dis 40&10 %
Vises.—Simpson's Adjustable.....dis 25&5 %
Howard Vise Co.....dis 25 %
Prentiss'.....dis 20 %
Weather Strips.—Packer's.....₱ doz $4.50
Browne's Flexible Rubber.....dis 30 %
In 25 feet boxes: No. 1, ⅜ in. wide, ₱ yard, 10c.; No. 2, ⅝ in., 15c.; No. 3, ¾ in., 20c.; No. 4, 1 in.....25c
Black Walnut Spring Weather Strips.....₱ doz $3.50
Window Springs.....d's 20 %
Babcock's No. 3.....₱ gross $6.25
Babcock's No. 4.....₱ gross 4.15
Wire Cloth.—"Clinton".....₱ ft 5.00
Wire Fence.—Scutt's Patent, Painted.....₱ lb 8½c
Scutt's Patent, Galvanized.....₱ lb 9½c
Wire Goods.—Gate Hooks and Eyes, &c., new list.....dis 55&10 %
Wrenches.—A. G. Coe's.....dis 40&10 %
Girard Mfg. Co.....dis 50 %
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Wringers.—
Novelty, No. 2.....₱ doz 42.00
Excelsior, No A.....₱ doz 60.00
Excelsior, No B.....₱ doz 66 00
Excelsior, No CC.....₱ doz 84.00
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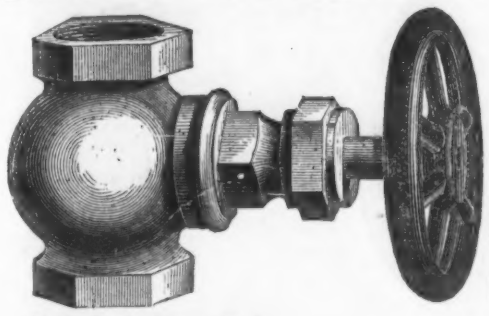

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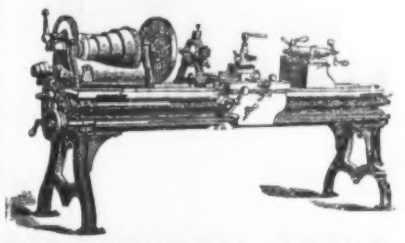

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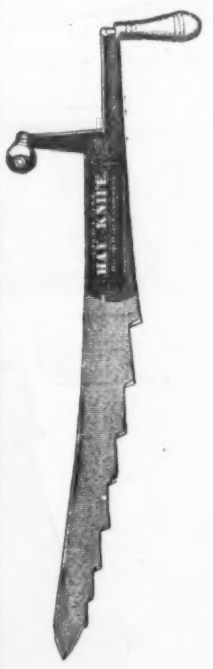

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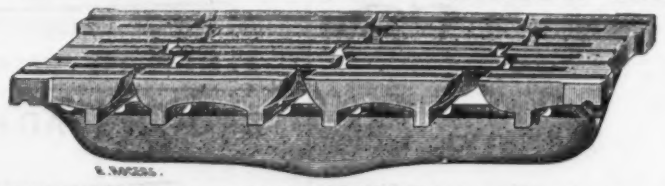

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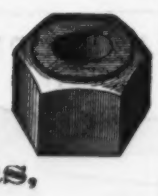

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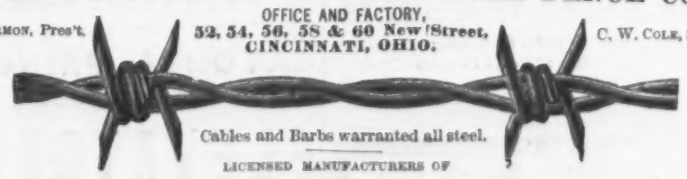

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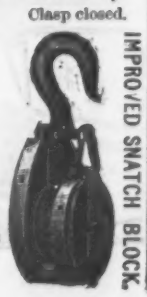

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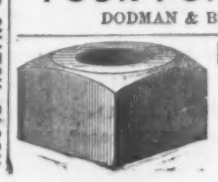

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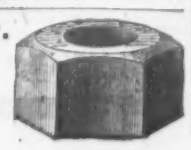

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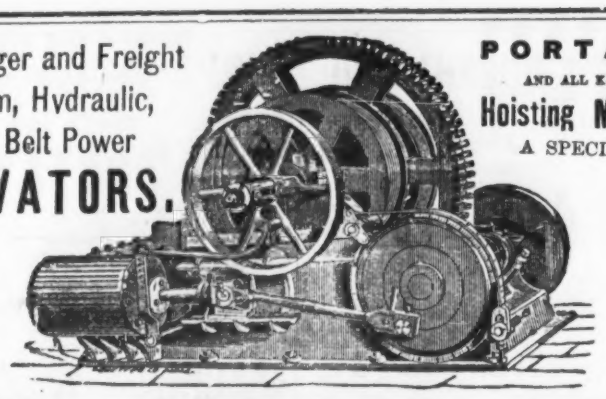

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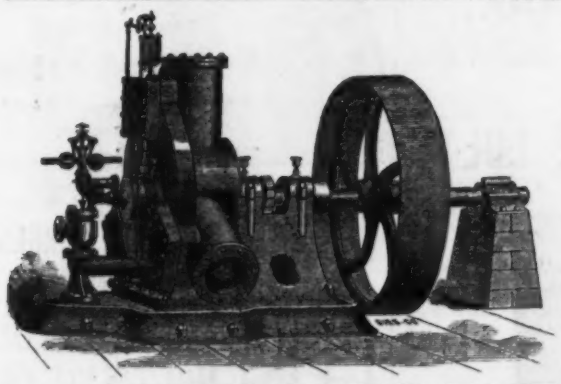

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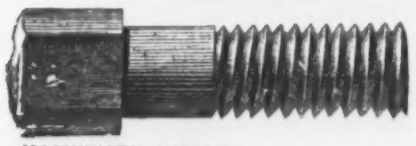

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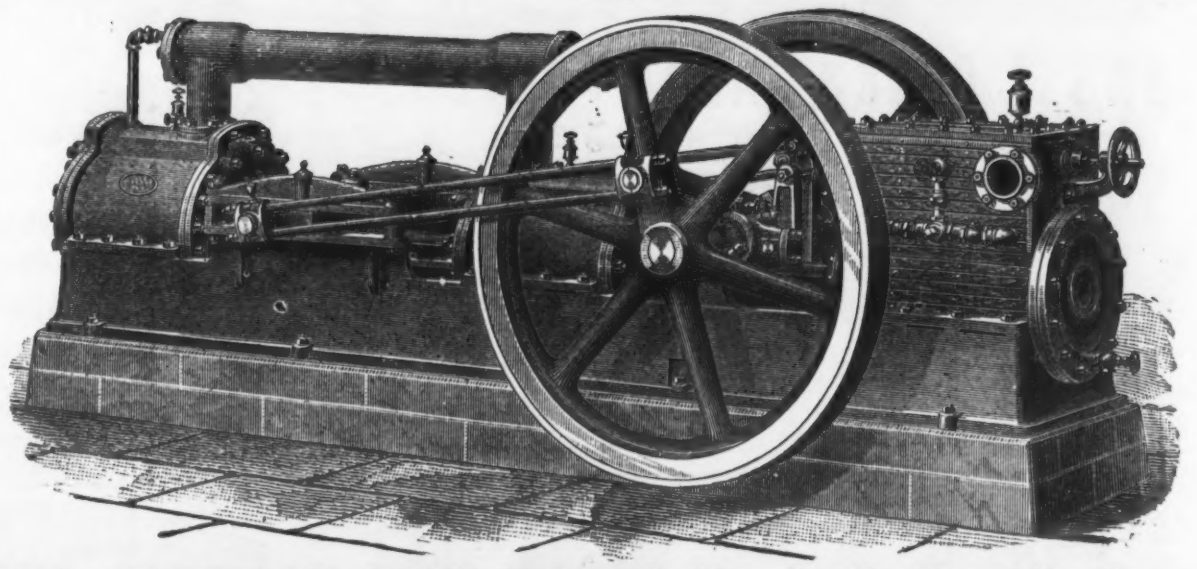

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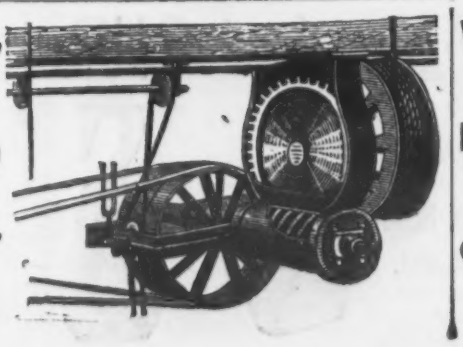

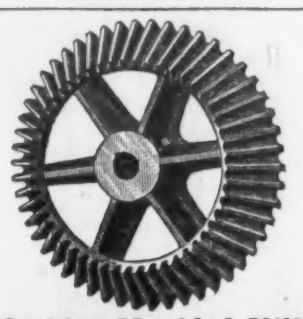

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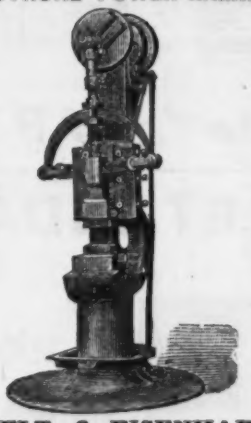

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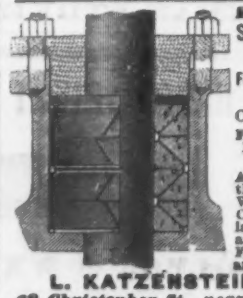

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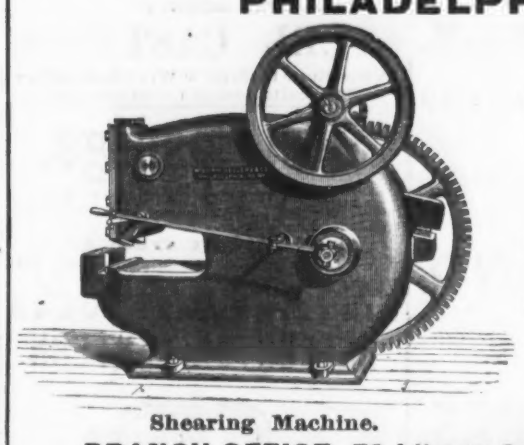

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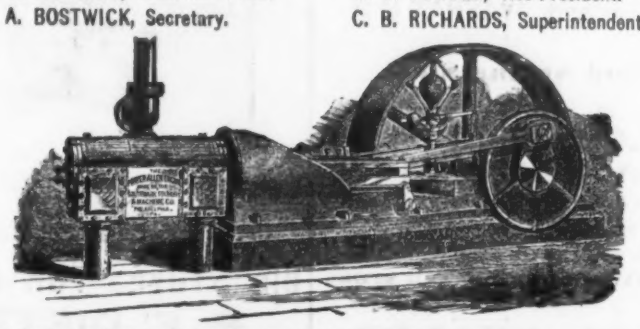

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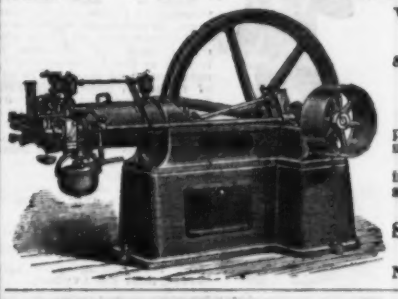

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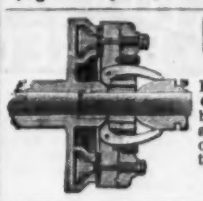

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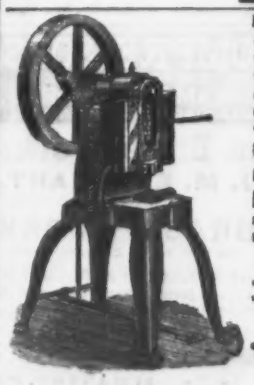

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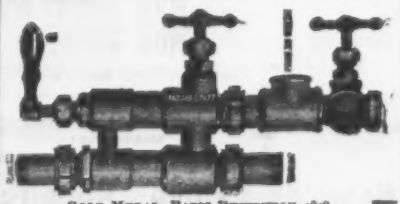

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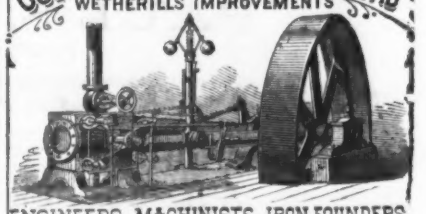

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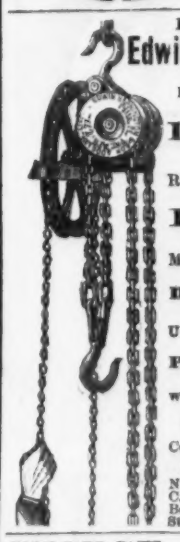

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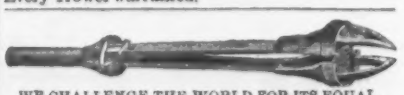

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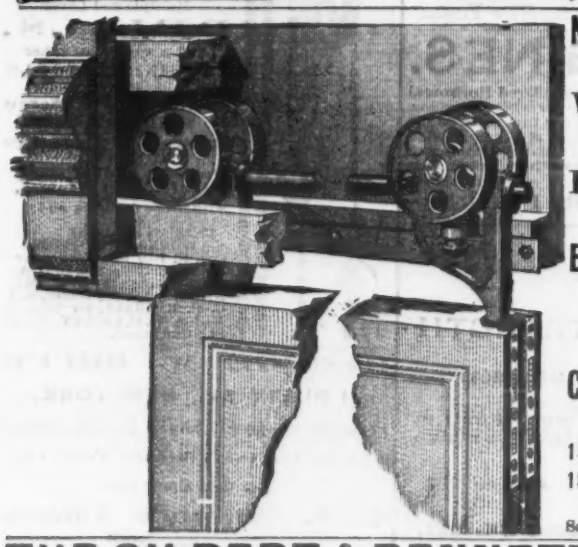

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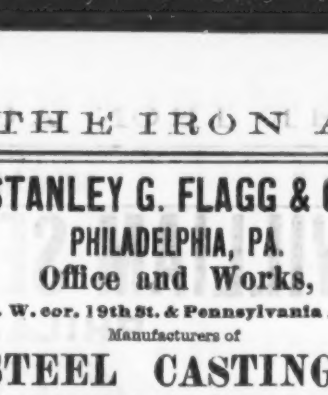

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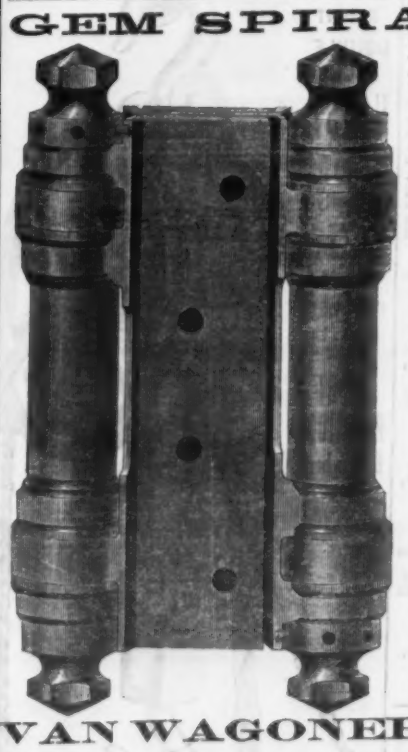

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